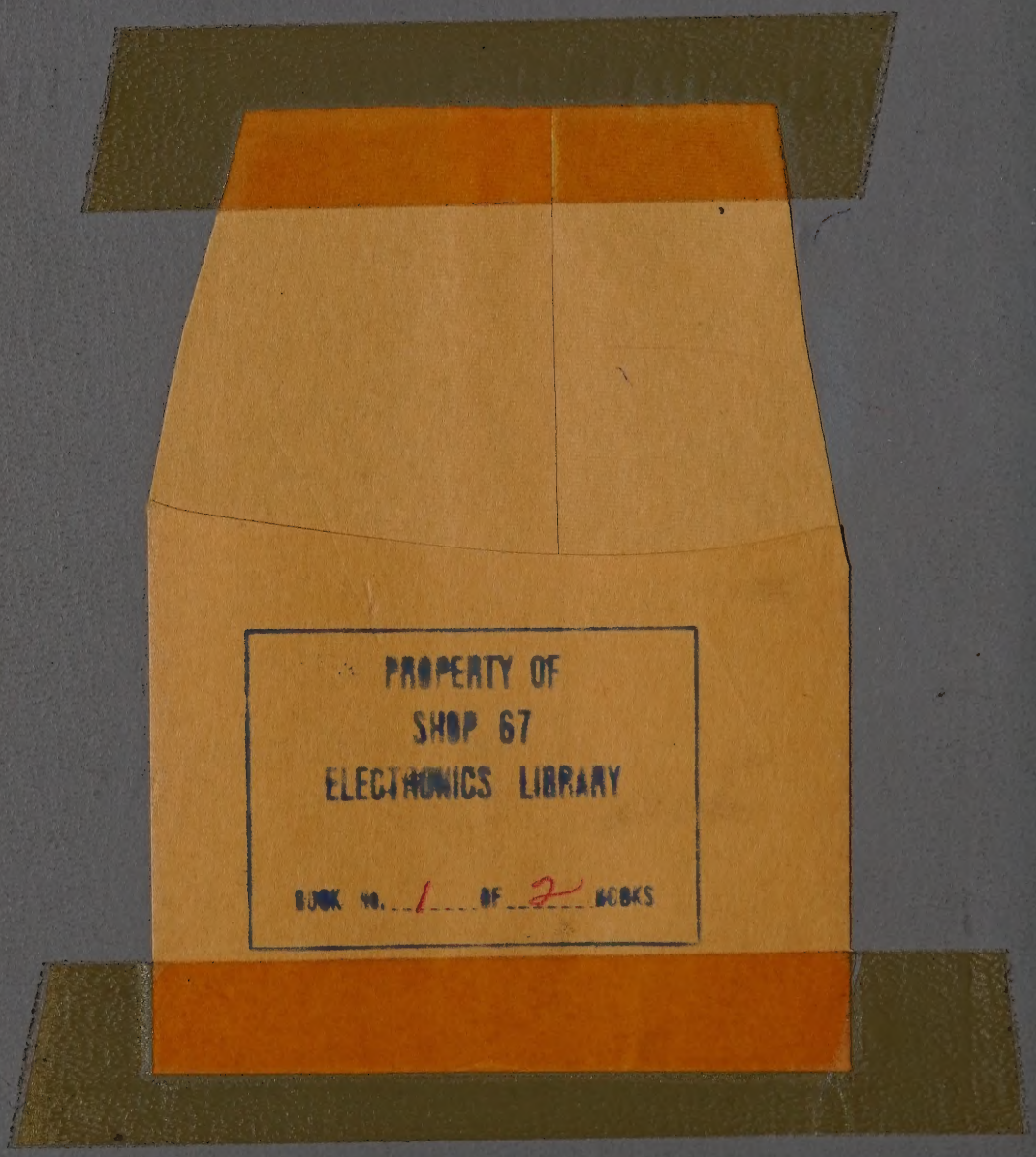
NAVSHIPS 93158(A) *(Non-Registered)*

TECHNICAL MANUAL
for
RECORDER SET, FACSIMILE AN/UXH-2

TIMES FACSIMILE CORP.
540 West 58th Street
New York 19, New York

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS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BOOK NO. 1 OF 2 BOOKS

14 June 1963

TEMPORARY CHANGE T-3 to Technical Manual for Facsimile Recorder Set, AN/UXH-2 NAVSHIPS 91358 (A).

This temporary change corrects existing errors in the technical manual and reflects the modifications made to all equipment at the factory by the manufacturer.

Maintenance Support Activities shall insert this change into the technical manual immediately upon receipt. When this change is included in the manual, the manual shall cover the equipment as though Temporary Change T-3 already has been incorporated into the equipment.

Make the following pen-and-ink corrections in the manual and mark "T-3" adjacent to them.

Page No.	CH. In Effect	Para. Fig. or Table No.	Line or Location	Action To Be Taken
ii	CH.2		Bottom	Add below previous Westrex listing: Westrex Company Contract: 540 West 58th Street NObsr-87502(X) New York 19, New York
3-7	Original	3-5 a.	8	Change word disable to energize.
3-7	Original	3-5 c.	12/13	Change number 120 to 60, change number 60 to 120.
3-9	Original	3-6 e.(3)	2	After B, add: (not shown)
4-2	Original	4-2 a.	11	Change V1B to V1A.
4-5	Original	4-2 b.	33/34/35	1. Change C110 to C110A. 2. Delete words operation of the relay, and substitute de-energizing action.
4-6	Original	4-2 b.	15	Change number 14 to 4.
4-7/8	Original	4-3	Lower Middle	Change K102 to K101.
4-9	Original	4-2 c.	37	Delete words and blower motors, and substitute motor.

TEMPORARY CHANGE T-3 to Technical Manual for Facsimile Recorder Set, AN/UXH-2 NAVSHIPS 91358 (A), (Continued).

Page No.	CH. In Effect	Para. Fig. or Table No.	Line or Location	Action To Be Taken
5-6	Original	5-3	Lower Middle	Change R132 to R130, and R130 to R132.
6.3-0	CH.1	6.3-2 a.	1	Add word SYNC before MOTOR CONTROL, R222.
6.3-25/26	CH.2	6-24	7C	Add C220 (.001 mfd) between pins 7 and 8 of V102B.
6.3-33/34	CH.2	6-28	Middle, Upper and Lower	1. At XV 206 pin 4, change XC 218 to XC 219 #7. 2. At XC 219, change XV 206# to XV 206#4.
7-3	Original	7-1	After C219	Add C220. Name and Description: Capacitor, Fixed, Ceramic Dielectric: .001 mfd ±20%, 500 vdc, MIL type CK60AW152M, TFC part 003/CC10212.
7-5	Original	7-1	F201	1. Change description to read: type, F03A250V5AS per MIL-STD-F-15160/03A.
			Alternate F201	2. Change description to read: type F03A250V3AS per MIL-STD-F-15160/03A.
			F601	3. Change description to read: type F03A250V10AS per MIL-STD-F-15160/03A.
7-21	CH.1	7-1	R219	Change description to read: RESISTOR, FIXED, WIREWOUND: 15,000 ohms ±5%, 4w; HH part 3/4 GA46; TFC part 004/RW15352.

14 June 1963

TEMPORARY CHANGE T-3 to Technical Manual for Facsimile Recorder Set, AN/UXH-2 NAVSHIPS 91358 (A), (Continued).

Page No.	CH. In Effect	Para. Fig. cr Table No.	Line or Location	Action To Be Taken
7-31	CH.1	7-2	T401	Change Federal number to: N5950-819-1947
7-33	Original	7-4	Between 18-19	Insert the following: Column 1: HH Column 2: Hardwick Hindle, Inc. Column 3: 40 Herman St., Newark, N.J.

TEMPORARY CORRECTION T-1 to TECHNICAL MANUAL FOR FACSIMILE RECORDER AN/UXH-2 NAVSHIPS 93158(A)

This temporary correction revises the manual to reflect the equipment changes made by Field Change 1-AN/UXH-2. The purpose of this field change is to modify the wiring in equipments 1 through 118 which have been accomplished in production of later models. The field change applies to equipments serial numbers 1 through 118 only. All other AN/UXH-2 equipments include the wiring change as a production change.

When this change is included in the manual, the manual shall cover the equipment as though Field Change 1-AN/UXH-2 had been accomplished on the equipment. This correction does not supersede any other corrections or changes.

Maintenance Support Activities shall make this correction in the technical manual immediately but shall keep the superseded data intact for support of equipments that have not been modified.

Holders of equipment accompanied by technical manuals shall not make this correction in the manual until accomplishment of the field change.

Make the following pen-and-ink corrections. Insert this temporary correction in the technical manual immediately after the front cover and preceding the title page.

In Figure 6-28 in the manual correct as follows:

1. Delete RED and YELLOW leads connected to pin 7 of XC219 and show these leads connected to pin 2 of XC219.

2. Delete buss jumper connection on pin 7 of XC219 and show jumper connection to pin 2 of XC219.

3. Show jumper from pin 4 of XV206 and pin 7 of XC219. Color code this wire ORANGE.

Record this action on RECORD OF CORRECTION MADE page.

This Technical Manual correction material was originally published as part of Field Change 1-AN/UXH-2 which appeared in EIB 557 dated 27 March 1961.

CHANGE 1 to Technical Manual for Recorder Set, Facsimile AN/UXH-2
NAVSHIPS 93158(A)

This permanent change revises the technical manual to reflect Factory Change No. 5 described in Addenda Sheet dated January 1959.

Maintenance Support activities shall insert this Change in the technical manual immediately upon receipt. When this Change is included in the manual, the technical manual shall cover the equipment as though Factory Change No. 5 has been accomplished on the equipment.

Holders of equipment, serial numbers 1 through 64 shall not insert Change 1 in the manual until the accomplishment of Factory Change No. 5, which has been made to equipment, serial numbers 65 and above. When inserted Change 1 supersedes Addenda Sheet dated January 1959.

1. Insert revised pages as indicated below:

Page	Remove	Insert
1-2A/Blank	-/-	Ch. 1/Blank

2. Make the following pen-and-ink corrections, and mark "Ch. 1" adjacent to the pen-and-ink correction, (see reference figures):

First Issued In	Page No	Ch. In Effect	Col or Fig.	Line or Location	Action
Ch. 1	T.P.	Original	-	Beneath approval date	Add: Change 1: 24 JUNE 1959
Ch. 1	ii	Original	Col 1 & 2	Between 3 & 4	In col 1, add: 1-2A In col 2, add: Ch. 1
Ch. 1	6.3-25/26	Original	6-24	Grid 11C	Add: CR107 across K102 (See reference fig.1B)
Ch. 1	6.3-29/30	Original	6-26	Socket XK102	Add: CR107 across pins 11 and 13 (See reference fig.1C)
Ch. 1	7-4	Original	Table 7-1	Between CR106 and CR201	Add: CR107, Ch. 1; Same as CR1; Stops S501 current surge. Fig. 6-24.

First Issued In	Page No.	Ch. In Effect	Col or Fig.	Line or Location	Action
Ch. 1	7-28	Original	Federal	MP 30	Change: 3110- to 5815-670-2802
Ch. 1	7-31	Original	Federal	T301	Change: N5950-581-8690 to N5950-630-0367

3. Remove and destroy the superseded Addenda Sheet dated January 1959, and then insert this Instruction Sheet just behind the front cover.

4. Make appropriate entry on Correction Page.

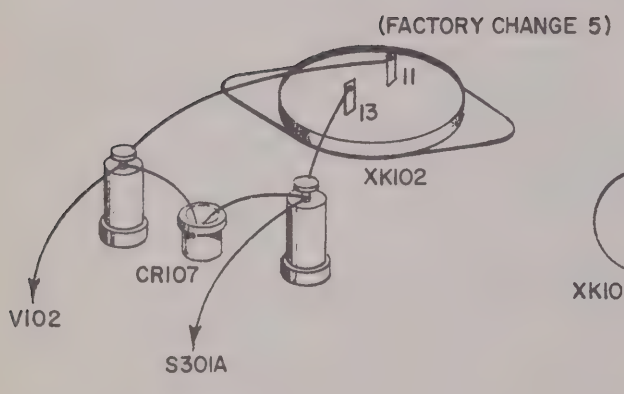

Figure 1A

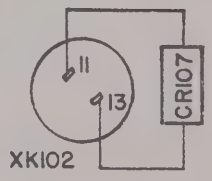

Figure 1C

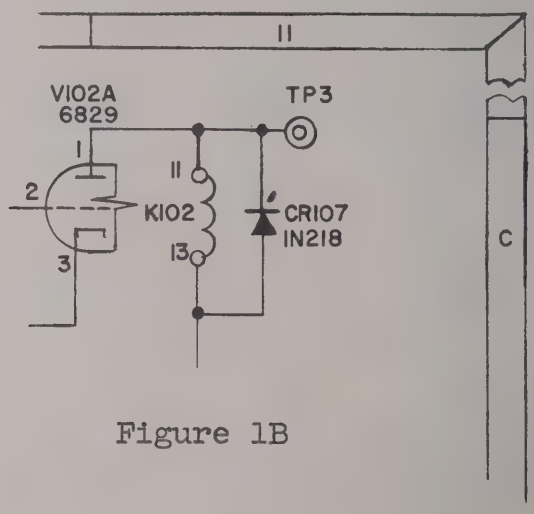

Figure 1B

NAVSHIPS 93158(A) *(Non-Registered)*

TECHNICAL MANUAL

for

RECORDER SET, FACSIMILE AN/UXH-2

TIMES FACSIMILE CORP.
540 West 58th Street
New York 19, New York

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS

Contract: NOBSR-71661 *Approved by BuShips: 8 July 1958*
Change 1. 24 June 1959

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGE IN EFFECT	PAGE NUMBERS	CHANGE IN EFFECT
Title page	Original	5-1 to 5-22	Original
ii to xi	Original	6.1-1 to 6.1-13	Original
1-0 to 1-4	Original	6.2-1 to 6.2-5	Original
2-1 to 2-4	Original	6.3-0 to 6.3-38	Original
3-1 to 3-14	Original	7-1 to 7-32	Original
4-1 to 4-20	Original	i-1 to i-6	Original

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS
WASHINGTON 25, D. C.

IN REPLY REFER TO
Code 695E

From: Chief, Bureau of Ships
To: All Activities concerned with the Installation, Operation, and Maintenance of the Subject Equipment

Subj: Technical Manual for Facsimile Recorder Set, AN/UXH-2, NAVSHIPS 93158(A)

1. This non-registered publication is the technical manual for the subject equipment and is in effect upon receipt. It supersedes NAVSHIPS 93158. Upon receipt hereof, NAVSHIPS 93158 shall be destroyed.

2. When superseded by a later edition, this publication shall be destroyed.

3. Extracts from this publication may be made to facilitate the preparation of other Department of Defense publications.

4. Errors found in this publication (other than obvious typographical errors), which have not been corrected by means of Temporary Corrections or Permanent Changes, should be reported. Such report should include the complete title of the publication and the publication number (short title); identify the page and line or figure and location of the error; describe the error or indicate what change should be made; and be forwarded to the Electronics Publications Section of the Bureau of Ships.

5. All Navy requests for NAVSHIPS electronics publications should be directed to the nearest Bureau of Supplies and Accounts Forms and Publications Supply Point. When changes or revised books are distributed, notice will be included in the Electronics Information Bulletin, NAVSHIPS 900,022, and in the Index of Bureau of Ships General and Electronics Publications, NAVSHIPS 250-020.

A. G. MUMMA
Chief of Bureau

RECORD OF CORRECTIONS MADE

CHANGE NO.	DATE	FIELD CHANGE NO.	SIGNATURE
#1	3-29-60		MC
EIB-557		Bjearney 5-19-61	

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SAFETY NOTICE

The attention of officers and operating personnel is directed to Chapter 67 of the *Bureau of Ships Manual* or superseding instructions on the subject of radio-safety precautions to be observed.

This equipment employs voltages which are dangerous and may be fatal if contacted by operating personnel. Voltages as high as 1,000 volts, 3600 cycles alternating current may be developed in the print amplifier circuit and 1,000 volts at 600, 400 or 300 cycles per second in the motor drive circuit of Recorder Set, Facsimile AN/UXH-2. Extreme caution should be exercised when working with the equipment. Make sure that the equipment is well grounded.

While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS.

Operating personnel must at all times observe all safety regulations.

Do not change tubes or make adjustments inside the equipment with the high voltage supply on.

To avoid casualties always remove power and discharge or ground circuits prior to touching them.

NEVER MEASURE POTENTIALS IN EXCESS OF 1,000 VOLTS BY MEANS OF FLEXIBLE TEST LEADS OR PROBES.

RESUSCITATION

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION BY THE PRONE PRESSURE METHOD SHALL BE PROMINENTLY DISPLAYED IN EACH RADIO, RADAR, OR SONAR ENCLOSURE. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.

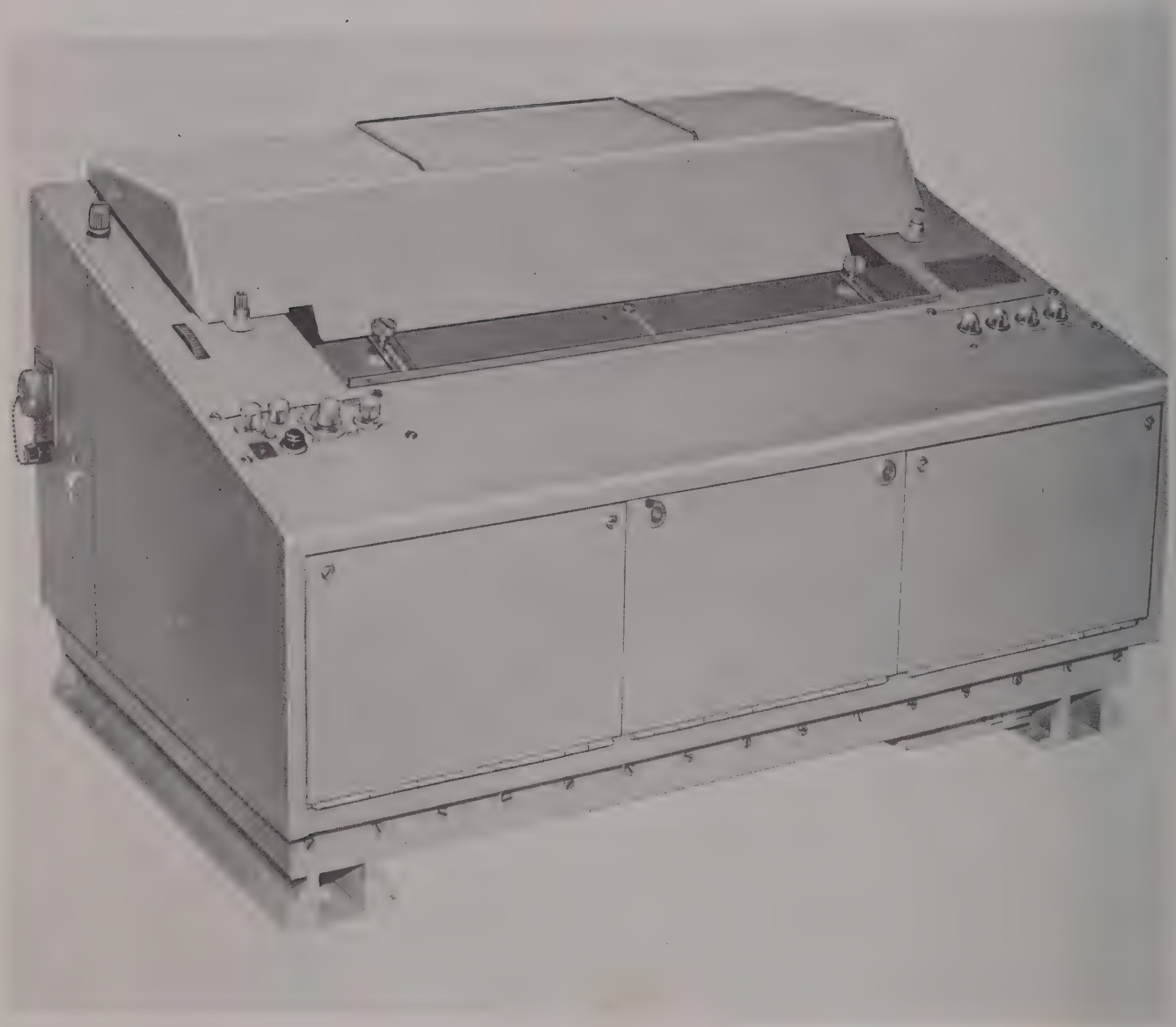


Figure 1–1. Recorder Set, Facsimile AN/UXH-2

SECTION 1
GENERAL INFORMATION

1–1. FUNCTIONAL DESCRIPTION.

Recorder Set, Facsimile AN/UXH-2 is a continuous page facsimile recorder designed to make a succession of direct recordings of weather maps, tactical graphic information, sketches, typewritten, printed or handwritten data, transmitted over land lines or radio.

When receiving from a transmitter which sends the proper control signals, the AN/UXH-2 will operate automatically. The unit will automatically phase, start recording at the beginning of a transmission, stop when the transmission is complete, and compensate for changes in signal level during the recording, thus permitting long periods of unattended operation. The unit can be operated manually when receiving from any transmitter having characteristics compatible with the recorder (see graph 1–3).

In general, facsimile signals can be received over a circuit designed for voice frequency transmission. The transmission requirements of the circuit are, however, more severe for facsimile than for voice. For best results, the circuit should have a frequency response within ± 2 db of the average from 1000 to 3000 cycles, and the maximum delay distortion in this band should not exceed ± 400 microseconds at 60 scans/minute and correspondingly less at higher speeds. Good results can usually be obtained even if the transmission circuit does not quite meet these requirements. The noise on the circuit should not be higher than 20 db below the maximum signal level for high quality received copy, as noise pulses show as small dots or short streaks on the recorded copy. Depending on the size of the letters, readable copy will still be obtained when the noise peaks are considerably higher than the facsimile signal level. Assuming 12 point type (pica), however, the r.m.s. noise level should not be higher than 10 db below the r.m.s. black signal level for complete readability.

Recorder Set, Facsimile AN/UXH-2 consists of three major assemblies enclosed in one cabinet (see figure 1–2).

a. RECORDER, FACSIMILE RO-76/UXH-2. –The recording mechanism (mech unit), consisting of the base casting, the stylus, run and sync mechanisms, the paper feed and exhaust air filter assemblies.

b. AMPLIFIER, ELECTRICAL CONTROL AM-1845/UXH-2.–The electrical chassis with the automatic control and amplifier circuits.

c. POWER SUPPLY PP-1901/UXH-2.–The power supply circuits and blower unit.

1–2. FACTORY CHANGES.

Factory changes made in Recorder Set, Facsimile AN/UXH-2 are described in Table 1–1. There have been no field changes as of the date of publication of this manual.

TABLE 1–1. RECORDER SET, FACSIMILE AN/UXH-2, FACTORY CHANGES

FACTORY CHANGE NO.	CHANGE TITLE AND PURPOSE	SERIAL NUMBER OF EQUIPMENTS AFFECTED	CHANGE ACCOMPLISHED IF:
1	Blower relay K2 eliminated to improve fork stability.	30 and above.	Switch S301 section C position 5 is connected to fuseholder XF204.
2	Capacitor C201 eliminated to improve fork stability and capacitor C203 changed from paper dielectric to mica dielectric to improve temperature characteristics.	34 and above.	Capacitor C201 is removed from the fork circuit terminal board, and capacitor C203 on same terminal board is a mica dielectric capacitor.
3	Resistor R232 changed from type RC20GF105K to type RC20GF684K to improve phasing reliability at low line voltages.	38 and above.	Resistor R232 is 680,000 ohms ±10%, ½W, instead of 1 megohm.
4	BLOWER fuse F204 (and spare 1 amp. fuse) changed from type F03G1R00A per MIL-STD-242A, MS No. 90079-1-1 to type F03G1R00B, MS No. 90079-20-1, to prevent the fuse blowing on momentary current surges.	55 and above.	Fuse F204 and spare 1 amp. fuse are time lag type rather than the normal blowing type.

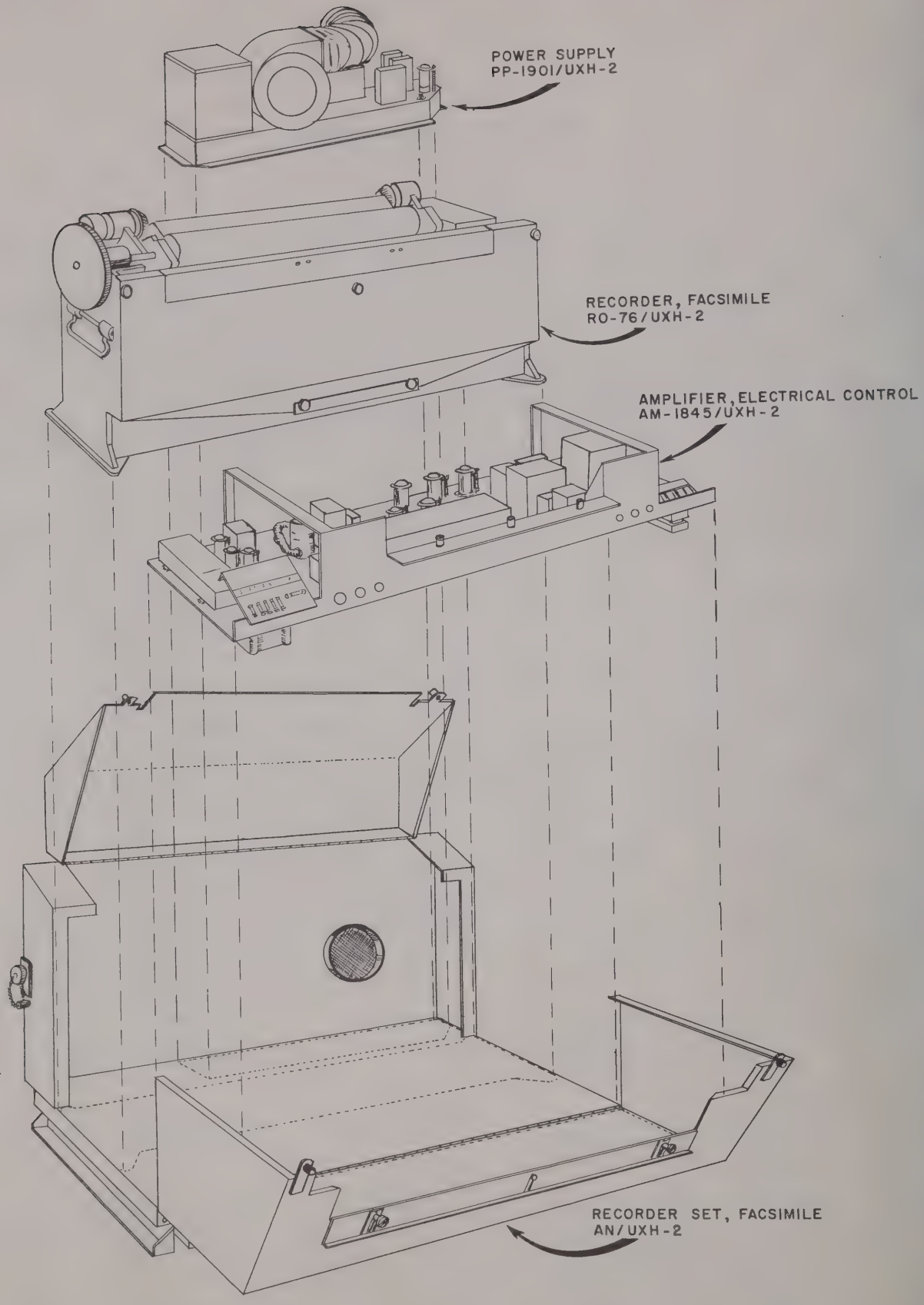


Figure 1—2. Major Assemblies of the AN/UXH-2

TABLE 1–1. RECORDER SET, FACSIMILE AN/UXH-2, FACTORY CHANGES (Cont)

FACTORY CHANGE NO.	CHANGE TITLE AND PURPOSE	EQUIPMENTS AFFECTED	CHANGE ACCOMPLISHED IF:
5	Silicon diode (CR107) has been added across pins 11 and 13 of relay socket (XK102) to eliminate inductive current surge when End-of-paper switch (S501) is activated.	Serial No. 65 and above.	CR107 is connected across pins 11 and 13 of XK102.

1–3. QUICK REFERENCE DATA.

a. Type of equipment – continuous web recorder.

b. Type of recording – direct stylus recording.

c. Type of recording paper – dry, electrosensitive recording paper or duplicating paper such as Timefax A or Timefax NDA on 19 1/8-inch wide roll.

d. Recording width – 18 3/4 inches.

e. Index of Cooperation – 576 (International); 1810 (I.R.E.)

f. Resolution – 96 lines per inch.

g. Scanning speed – 60, 90 or 120 scans per minute.

h. Recording time – 19.2 minutes for 12 by 18 1/2 inch copy at 60 scans per minute.

i. Type of modulation – amplitude modulated.

j. Input frequency – 600 to 4200 cps.

k. Control signal – 1800 to 3600 cps carrier modulated by 300 cps to start, 60 cps to start record, 450 cps to stop.

l. Signal Level – +4 to –36 dbm.

m. Input signal contrast – 8 to 16 db.

n. Input impedance – 600 ohms.

o. Black recording – maximum density on maximum signal level.

p. Power requirements – 115 or 230 volts, 45 to 65 cps, single phase.

q. Power consumption – 275 watts at 115 or 230 volts.

1–4. EQUIPMENT LISTS.

TABLE 1–2. EQUIPMENT SUPPLIED

QUAN. PER EQUIP.	NOMENCLATURE		*OVERALL DIMENSIONS			*VOLUME	*WEIGHT
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
A.							
	Recorder Set, Facsimile including	AN/UXH-2	16	30	21-3/4	6	**214
7	Spare Fuses						
1	Stylus Needle Alignment Fixture						
1	Stylus Holder Alignment Fixture						
3	Retainer Ring Pliers						
5	Hex Nut Keys						
1/2 lb	Activated Carbon						
10′	Exhaust Hose						
1	Plate Ass'y Adapter for 10′ Hose						
2	Instruction Books						
1	Amplifier Electrical Control	AM-1845/UXH-2	7	29-5/8	9-9/32	1.1	
1	Recorder, Facsimile	RO-76/UXH-2	14-3/4	27-3/4	10-1/8	2.4	
1	Power Supply	PP-1901/UXH-2	8-7/8	21	6-1/12	.65	

*Dimensions are in inches, volume in cubic feet, weight in pounds.

**Weight of unit includes weight of separable items.

TABLE 1–3. RECORDER SET, FACSIMILE AN/UXH-2, EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED

QUAN. PER EQUIP.	NOMENCLATURE		REQUIRED USE	REQUIRED CHARACTERISTICS
	NAME	DESIG.		
1	Freq. Shift Converter Instruction Book for CV-172A/U	CV-172A/U NAVSHIPS 91628	To convert audio freq. shift AFS signal from radio receiver to AM. (Not required for receiving facsimile signals from wire lines or special radio circuits which have *no* fading.)	Provides output of —10 dbm
1	Receiver, Radio Instruction Book for radio receiver	RBD or RBC	For receiving radio facsimile transmissions. (Not required for receiving facsimile signals from wire lines.)	Stable converter and beat frequency oscillators.

TABLE 1–4. SHIPPING DATA

BOX NO.	NOMENCLATURE		*OVERALL DIMENSIONS			*VOLUME	*WEIGHT
	NAME	DESIG.	HEIGHT	WIDTH	DEPTH		
1	Recorder Set, Facsimile, including Amplifier, Electrical Control Recorder, Facsimile Power Supply	AN/UXH-2 AM-1845/UXH-2 RO-76/UXH-2 PP-1901/UXH-2	26½	40	28¼	17.4	325
2	Timefiax Recording Paper	NDA	13¾	40½	22½	7.2	205
3	Maintenance Parts		10¼	17	11¼	1.2	15

*Unless otherwise noted, dimensions are in inches, volume in cubic feet, and weight in pounds; equipment crated and ready for shipment.

TABLE 1–5. ELECTRON TUBE AND SEMI-CONDUCTOR COMPLEMENT

UNIT	NUMBER OF TUBES AND SEMI-CONDUCTORS OF TYPES INDICATED												
	1N204	1N218	1N1095	6L6WGB	12AT7WA	5654	5670	5687WA	5727/ 2D21W	6386	6627/ 0B2WA	6829	TOTAL
Amplifier, Electrical Control AM-1845/UXH-2													
Automatic level control, signal amplifier, and print circuits 1-99 group		6		2	1		1			1			11
Automatic control circuit 100-199 group		5			1		2	2			1	1	12
Fork and sync motor drive circuit 200-299 group	1			2		1	3		1				8
Power Supply PP-1901/UXH-2 400-499 group			7										7
Total number of each type	1	11	7	4	3	1	6	2	1	1	1	1	38

SECTION 2
INSTALLATION

2–1. UNPACKING AND HANDLING.

Recorder Set, Facsimile AN/UXH-2 is packed in a large wooden case, box No. 1, with the Amplifier, Electrical Control AM-1845-UXH-2 (electrical chassis), Recorder, Facsimile RO-76-UXH-2 (mechanical unit), and Power Supply PP-1901/UXH-2 (power supply and blower unit) mounted in the cabinet. The equipment spares and recording paper are each packed in separate boxes.

The recorder set, the spares and the paper are each contained in an inner cardboard carton which is wrapped with hermetically sealed foil; then an outer cardboard carton and on the outside, a wooden crate.

The AN/UXH-2 and the spares are electronic and precision mechanical equipment which must be unpacked and handled carefully. Before unpacking, the equipment and spare cases should be kept in an upright position.

Figure 2–1 shows the method of unpacking the equipment. The spares are similarly packed except that each spare component is individually wrapped, and the separate containers put in the spare parts box. When paper is supplied, each roll is packaged in an individual carton, four cartons then packed together to form a unit pack. The paper and spares cardboard cartons may be opened from the top rather than the side as specified for the equipment carton.

Inspect the equipment to make sure that there has been no damage in shipment. Check particularly that there is a stylus needle properly seated in each of the three positions on the band and that the groove in the band is seated on the wire on the wheels. Check that there are no broken tubes or any out of their sockets. Make sure there is a fuse in each of the four fuseholders on the left side of the sloping panel, and one in the fuseholder on the left side of the equipmnt.

2–2. SITE SELECTION.

Overall dimensions of the equipment and mounting details are shown in the installation diagram, figure 2–2.

Mount the recorder on a table or platform convenient to the AC power outlet and the incoming signal lines. Be sure that the surface selected is capable of supporting the weight of the recorder, that there are sufficient clearances for ease of operation and maintenance, and that there is at least 12 inches between the rear of the cabinet and the nearest wall to ensure adequate ventilation and to permit the recorded paper to fall freely behind the machine. When the set will be run for long hours of unattended operation without the recorded copy being removed, there should be at least 18 inches of space behind the equipment for the recorded paper. If the 10-foot long exhaust hose will be used instead of the activated carbon exhaust filter (see paragraph 2–4*b*), the equipment should be near a window or other opening through which the 3½-inch diameter hose can be passed.

2–3. POWER REQUIREMENTS.

Recorder Set, Facsimile AN/UXH-2 will operate over the ranges of 90 to 130 volts and 180 to 260 volts, supplied from a single phase, 45 to 65 cycles per second power source The primary power distribution is shown in figure 5–4.

2–4. INSTALLATION REQUIREMENTS.

With the selector switch on the control panel (figure 3–1) in the OFF position, connect the input signal leads to the signal input terminals on the rear left (looking from rear) of the recorder (figure 2–2).

a. LINE VOLTAGE.–Check what line voltage is available.

As shipped from the manufacturer, the equipment is set up for 115-volt operation. For this voltage, the LINE fuses are 5-ampere fuses and the connection from the power supply to the electrical chassis is through terminal 6 of terminal board TB601 (figure 2–3).

If a 220-volt circuit is to be used, unscrew the 110-VOLT 5 AMP nameplate near the LINE fuseholder on the left side of the sloping panel and turn it over so that it will read 220-VOLT 3 AMP. Replace both fuses with 3 amp 3AG fuses. (There are two such 3-amp fuses on the left, inside the sloping panel. Loosen the knurled screw on each side of the sloping panel and pull the front portion of the cabinet forward.) Then loosen the knurled screw and raise the cover of the interconnecting terminal boards (figure 2–3). Transfer the gray/orange lead from the left side of terminal 6, TB601, to the left side of the terminal 5 of TB601.

If the line voltage is between 90 and 115 volts, or between 180 and 230 volts, leave the LINE VOLTAGE switch on the power supply (figure 4–9) in the LOW position. If the line voltage is between 115 and 130 volts or between 230 and 260 volts, put this switch in the HIGH position.

b. EXHAUST ARRANGEMENT.–There are two methods by which the exhaust fumes and dust may be removed from the equipment. As shipped from the factory, a canister containing activated carbon is mounted on the rear wall of the cabinet to filter the air as it is evacuated from the recording area by the blower unit. If preferred, an extension hose (supplied as an accessory item — packed in spare parts box) may be used instead of the carbon to emit the evacuated air out a window or similar opening.

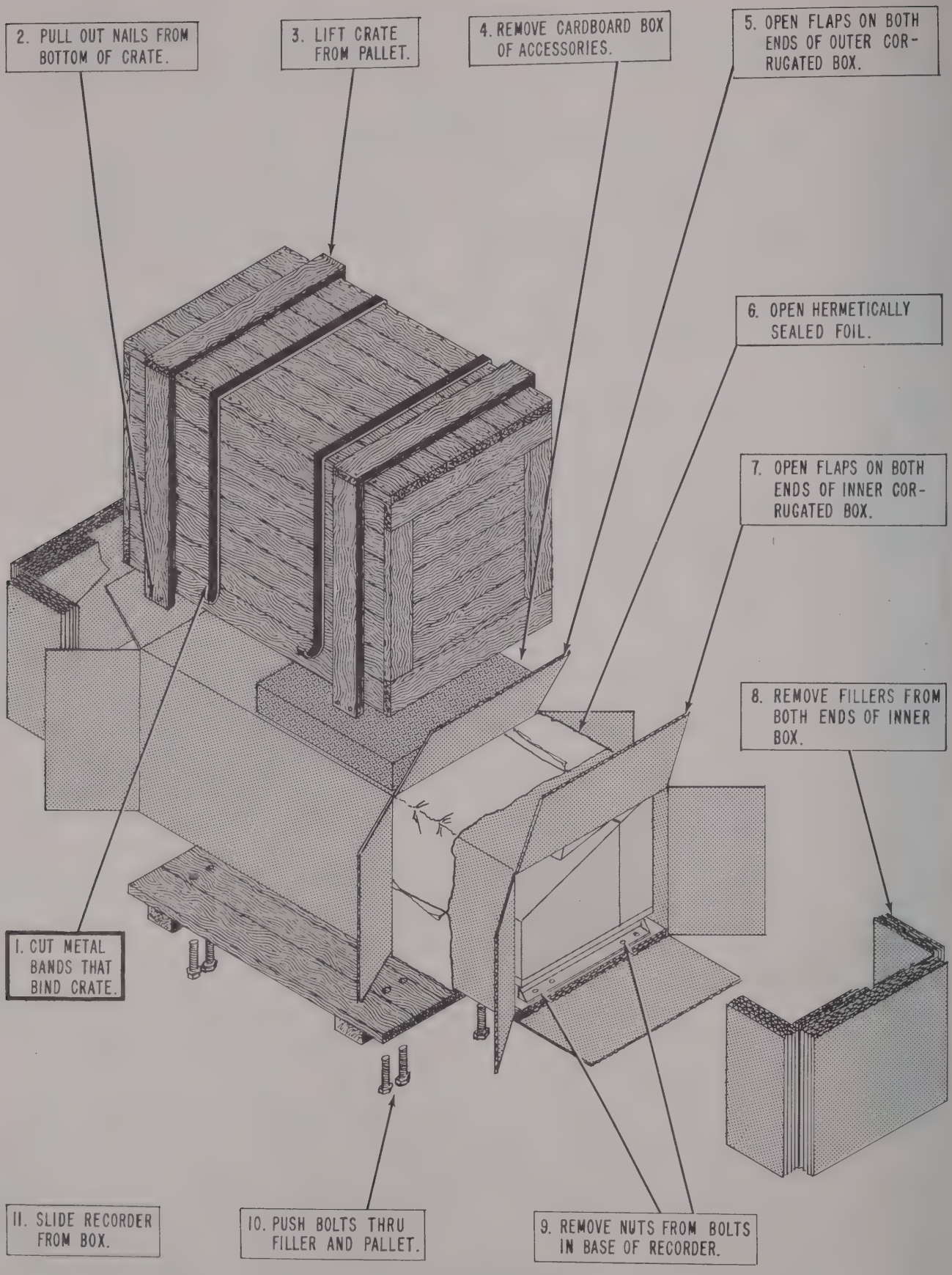

2. PULL OUT NAILS FROM BOTTOM OF CRATE.
3. LIFT CRATE FROM PALLET.
4. REMOVE CARDBOARD BOX OF ACCESSORIES.
5. OPEN FLAPS ON BOTH ENDS OF OUTER CORRUGATED BOX.
6. OPEN HERMETICALLY SEALED FOIL.
7. OPEN FLAPS ON BOTH ENDS OF INNER CORRUGATED BOX.
8. REMOVE FILLERS FROM BOTH ENDS OF INNER BOX.
1. CUT METAL BANDS THAT BIND CRATE.
11. SLIDE RECORDER FROM BOX.
10. PUSH BOLTS THRU FILLER AND PALLET.
9. REMOVE NUTS FROM BOLTS IN BASE OF RECORDER.

Figure 2–1. Recorder Set, Facsimile AN/UXH-2, Unpacking Instructions

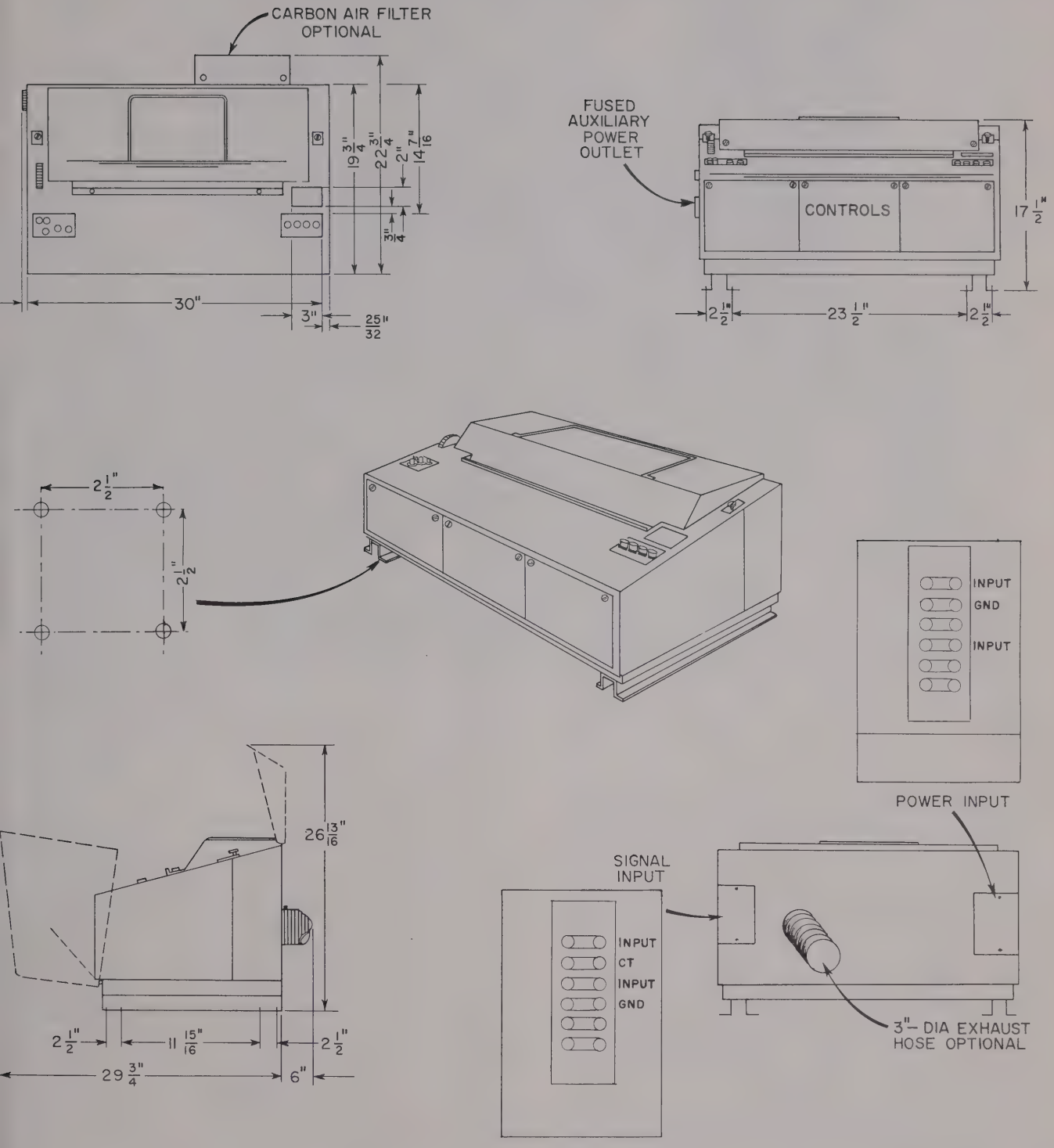


Figure 2–2. Recorder Set, Facsimile AN/UXH-2, Outline Drawing and Installation Diagram

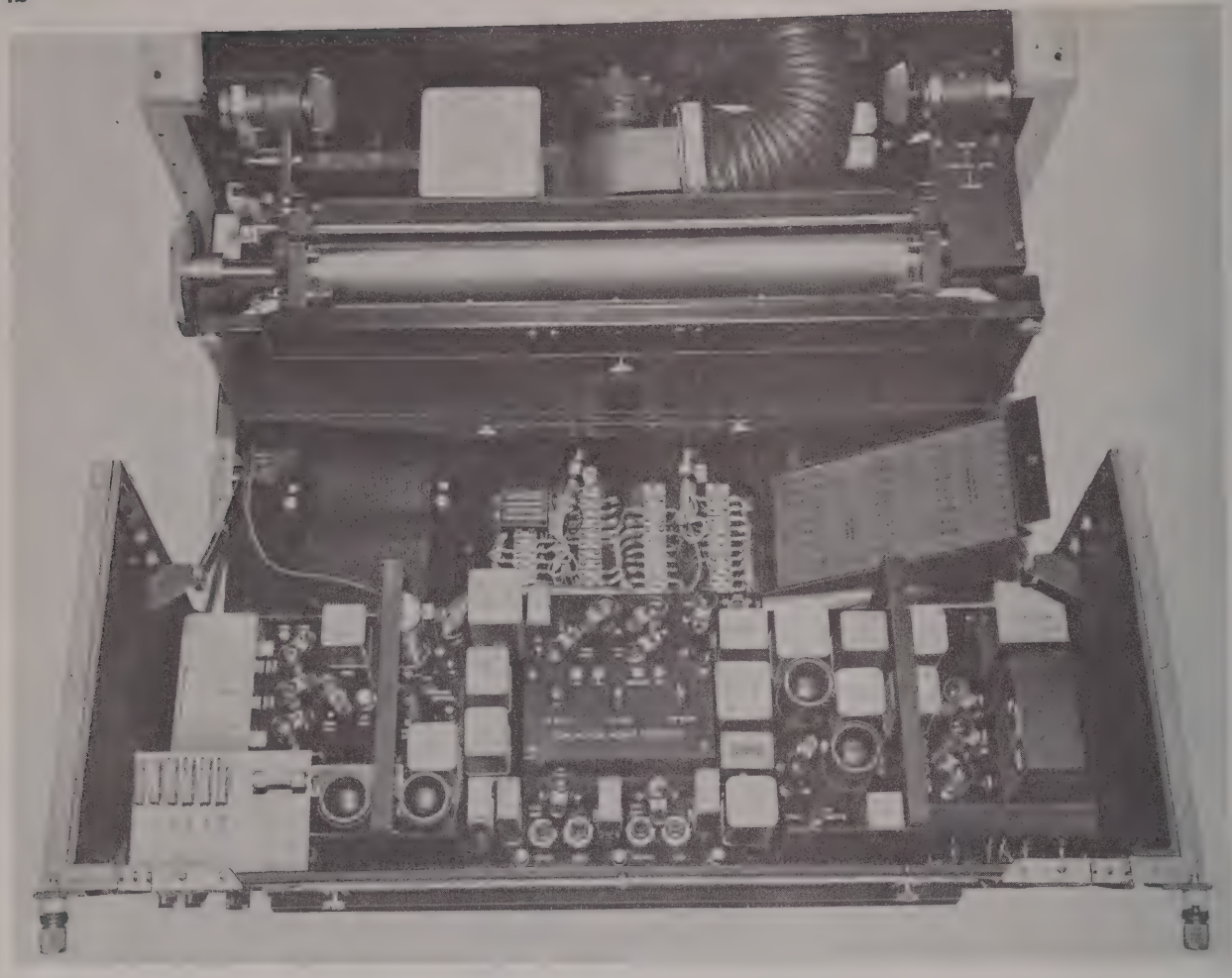


Figure 2–3. Recorder Set, Facsimile AN/UXH-2, Top View, Interconnecting Terminal Boards Cover Open

If the extension hose is to be used, first remove the canister assembly by taking out the eight 10-32 x ½ hex head screws that mount the canister assembly to the rear wall. In place of the canister assembly, mount the hose plate assembly (A601) (also packed in spare parts box) on the rear of the cabinet with the two 10-32 x ½ binding head screws supplied with the hose plate assembly. Clamp one end of the extension hose to the hose plate assembly with the 3½-inch hose clamp (in spare parts box). Extend the other end of the hose through the desired vent.

c. AC POWER SUPPLY.—Connect the power cord spade lug leads to the AC power input barrier strip (TB606) on the rear of the cabinet. The red lead goes to the terminal marked "GND"; the black and white leads to the terminals marked "INPUT".

Make sure the selector switch is in the OFF position and connect the 3-conductor plug of the power cable into an appropriate power source outlet.

The receptacle on the left side of the cabinet is connected directly to the AC power line and may be used as an accessory outlet for a maximum load of 10 amperes.

2–5. INSPECTION AND ADJUSTMENTS.

Wipe off any loose material, dirt or lint with clean, lint-free cloth, being careful not to bend or damage the stylus assemblies (figure 4–14) or paper guide spring assembly (figure 4–10).

Lower the control panel door by loosening the two knurled screws on the center panel. Turn the selector switch (figure 3–1) to STAND BY. Check that the POWER ON light glows (left side of sloping panel) and that, after about a minute warm-up time, all the tube heaters are lit.

Check the operation of the equipment as described in paragraph 5–3*c* and Table 5–1.

Open the spare parts case and examine the contents for broken or damaged parts. Check electrical components for broken tubes, etc.

CAUTION

Do not handle the spare band any more than is absolutely necessary.

2–6. PREPARATION FOR RESHIPMENT.

Clean the equipment and lubricate (see paragraph 6.1-5) before repacking. Close all covers securely.

Repack the equipment in the original containers, if possible, using enough cushioning material to prevent movement within the container.

SECTION 3
OPERATOR'S SECTION

3–1. FUNCTIONAL OPERATION.

Recorder Set, Facsimile AN/UXH-2 makes direct recording of maps, sketches, typed, printed or handwritten information sent from a distant transmitter. Providing the transmitting equipment is able to send the proper control signals, the recorder will automatically phase, adjust for the optimum printing level, start the recording at the beginning of copy signals, and stop at the end of the transmission. The recorder may also be operated manually to record information sent by any transmitter with compatible characteristics (see paragraph 1–3).

The facsimile signals may be recorded directly from wire circuits, or from radio circuits if the proper auxiliary equipment is used. The quality of the recording depends somewhat upon the quality of the transmission facilities. Poor transmission line characteristics, such as delay distortion, a non-linear frequency response, extraneous signals due to cross-talk and induction fields, may degrade the copy.

This recorder is designed for recording black and white copy. When a photograph or original with half tones is transmitted, the AN/UXH-2 will record some gray shades, but they are not likely to be an accurate representation of the original and, therefore, it is not recommended that the AN/UXH-2 be used to record such transmissions.

When automatic operation is utilized, once the equipment is turned on to RUN position, the AN/UXH-2 may be left unattended. A control signal from the transmitter will start the recording and paper feed mechanisms. On receipt of phasing signals, the recorder unit will position the stylus needles so that the edge of the recorded copy is properly related to the edge of the paper. When copy signals are received, the stylus needles will print as the paper advances, the density of the recording being automatically adjusted to the desired level by the control circuits of the recorder. An exhaust system causes air from around the recording stylus needles to pass through filters to remove the carbon residue and to be released through activated carbon to remove any odor. When stop signal is received, the stylus needles stop and the paper ceases to advance. The copy is legible as soon as it is recorded. The paper may be advanced manually at any time to remove any section of the recording, but if this is done while copy is being received there will be a blank space in the copy equal to the amount the paper has been advanced.

The equipment is operated manually when the transmitting station from which the copy is being sent is not able to transmit the necessary control signals. In manual operation the equipment is phased, the recording started and stopped by means of controls on the front panel.

In either automatic or manual operation, the operator may use a front panel DENSITY control to adjust the density of the printing.

3–2. PREPARATION FOR USE.

The AN/UXH-2 recorder can be operated under typical field conditions where a 90- to 130-volt or 180- to 260-volt, 45 to 65 cps, single phase power source of 275 watts is available and the transmission line characteristics meet the requirements mentioned in paragraph 1–1. The signal lines are connected to the input terminals at the rear of the equipment (figure 2–2).

CAUTION

Do not plug in the AC power cord until the requirements of the following paragraph have been met.

The line voltage at which the equipment operates is a factor in determining how the equipment is set up. The nameplate under the LINE fuseholders should be turned to the appropriate 110-volt or 220-volt side and there should be a fuse rated for the corresponding voltage in each of the LINE fuseholders (see paragraph 2–4). The grey and red wire on the left side of terminal board TB601 should be connected to terminal 6 for 110-volt operation, to terminal 5 for 220-volt operation (see figure 2–3 and paragraph 2–4). The LINE VOLTAGE switch on the power supply should be in HIGH for voltages between 115 and 130 or 230 and 260, and in LOW for voltages between 90 and 115 or 180 and 230 volts.

3–3. OPERATING PROCEDURES.

a. CONTROLS USED BY THE OPERATOR.—All the operating controls are accessible by lowering the door in the front center of the equipment (figure 3–3) to expose the control panel (figure 3–1).

(1) SELECTOR SWITCH. – The OFF, STAND BY, START, SYNC and RUN positions of this switch determine to what parts of the equipment power is applied and hence the operating stage of the equipment.

In OFF position power is removed from all sections of the recorder, except the auxiliary power outlet on the left rear side of the cabinet.

In STAND BY position, power is applied to the B+ circuitry, to all tube heaters, and to the bias supplies. To prevent the recording mechanism from accidentally starting before the selector switch has been turned to RUN,

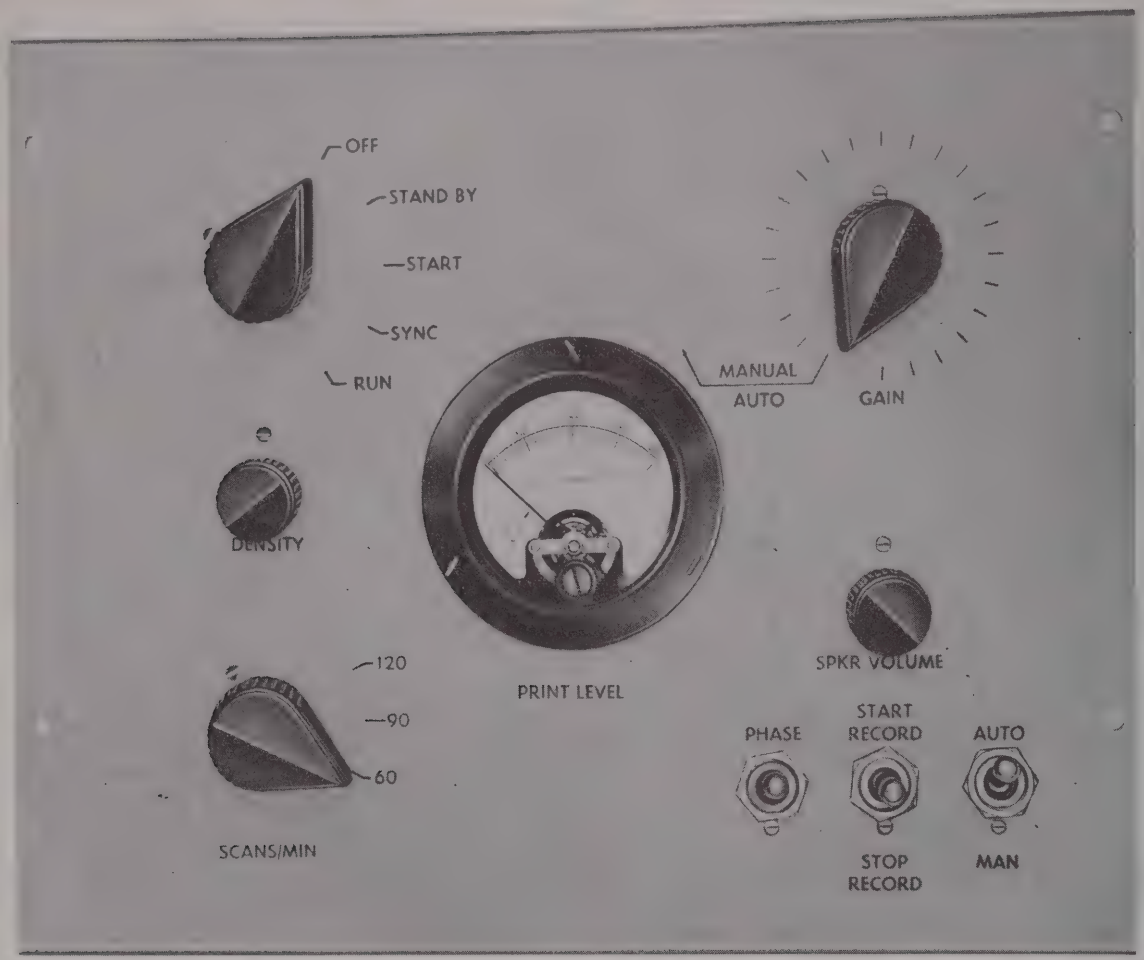


Figure 3–1. Recorder Set, Facsimile AN/UXH-2, Control Panel

a positive potential is applied to the grid of tube V102B in the start/stop signal detecting circuit. To keep print power from the stylus needles until the switch has been turned to RUN a positive potential is applied to the grids of print amplifier tubes V5 and V6.

In START position, B+ is removed from the print amplifiers V5 and V6 and a voltage is applied to the start motor which brings the sync motor above synchronous speed. A positive potential is applied to the grid of the stop/start relay tube V102B to ensure its conduction so that the stop/start relay K101 will lock itself in the operated condition.

In SYNC position, power is still applied to the start motor and also to the sync motor through the motor amplifier tubes V206 and V207. A positive potential is still applied to the grid of V102B in the signal detecting circuit to make sure the recording mechanism does not start.

In RUN position, power is removed from the start motor, and the sync motor coasts down into synchronous speed. RB+ is applied to the start record relay K102. Power is applied to the blower motor and made available to the run motor so it will operate when the start record signal is received. The positive potential is removed from V102B so that it will respond to the transmitted control signals.

(2) DENSITY.–This potentiometer permits a change in recording density during automatic operation by varying the DC voltage on the screens of the print amplifier tubes.

(3) SCANS/MIN.–The 60, 90 and 120 positions of this rotary switch determine the speed at which the recorder operates. This controls the speed of the synchronous and run motors. The setting of this switch should coincide with the scan rate of the transmitter.

(4) GAIN.–This potentiometer is used when the type of transmission makes use of the automatic level control (ALC) circuit impractical. In the full counterclockwise AUTO position, the ALC circuit will adjust the amplification of the signal to the print drive tubes for optimum recording. In either manual or automatic operation, turning the GAIN control disables the ALC circuit and the GAIN control is used to adjust the input signal level to the print amplifiers to control the density of the recording. For optimum recording level, the GAIN control is usually set, on receipt of phasing pulses, for a meter reading of 100.

(5) SPKR VOLUME.—This potentiometer regulates the input to the speaker amplifier and hence the loudness of the monitoring signal heard from the loudspeaker.

(6) PHASE.—This momentary toggle switch is used during manual operation to release the phase magnet when phasing signals are being received. It may also be used to release the phase magnet when the equipment is not recording, for making maintenance checks.

(7) START RECORD/STOP RECORD.—This momentary toggle switch may be used to start or stop the recording at any time, but it is basically used in manual operation. The START RECORD position of this toggle switch is used during manual operation of the equipment to apply power to the run motor and start the recording mechanisms when copy signals start. The operator uses the STOP RECORD position during manual operation to cut off power to the run motor and to stop the recording mechanisms when copy signals stop. This switch may also be used when the equipment is operated automatically.

(8) AUTO/MAN.—This toggle switch disables the automatic phasing, start and stopping features of the equipment when it is in MAN position. The input to the start/stop signal selector and record amplifiers is shorted to ground and power removed from the phasing circuit. In AUTO position, the control circuits will operate automatically.

(9) PAPER ADVANCE WHEEL.—The knurled round disc protruding through the left side of the sloping panel (figures 3–2 and 3–3) is used to advance the paper when loading a new roll and to bring the end of a transmission up to the tear-off strip.

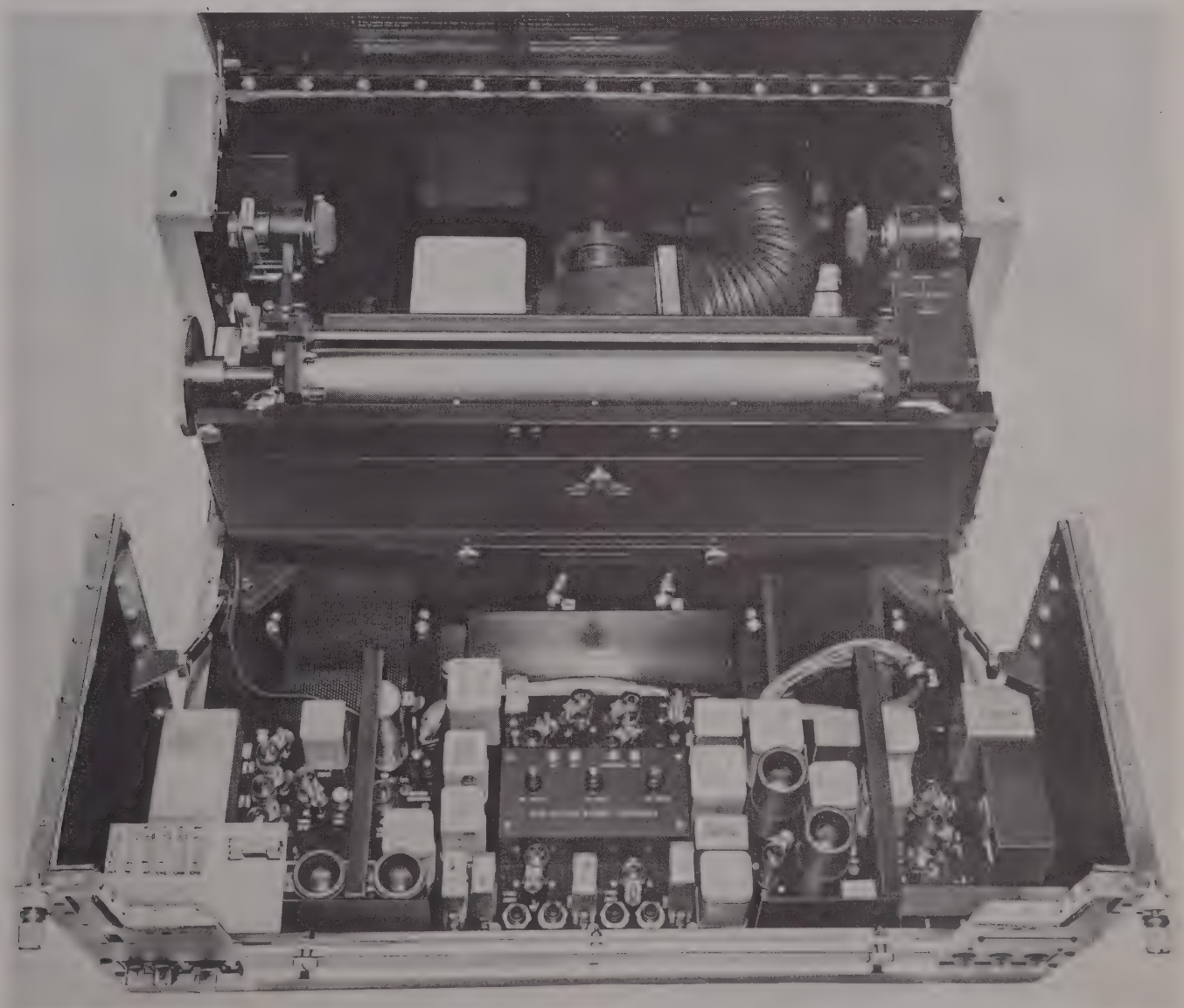


Figure 3–2. Recorder Set, Facsimile AN/UXH-2, Front View, Top Cover Open and Front Portion of Cabin Pivoted Forward

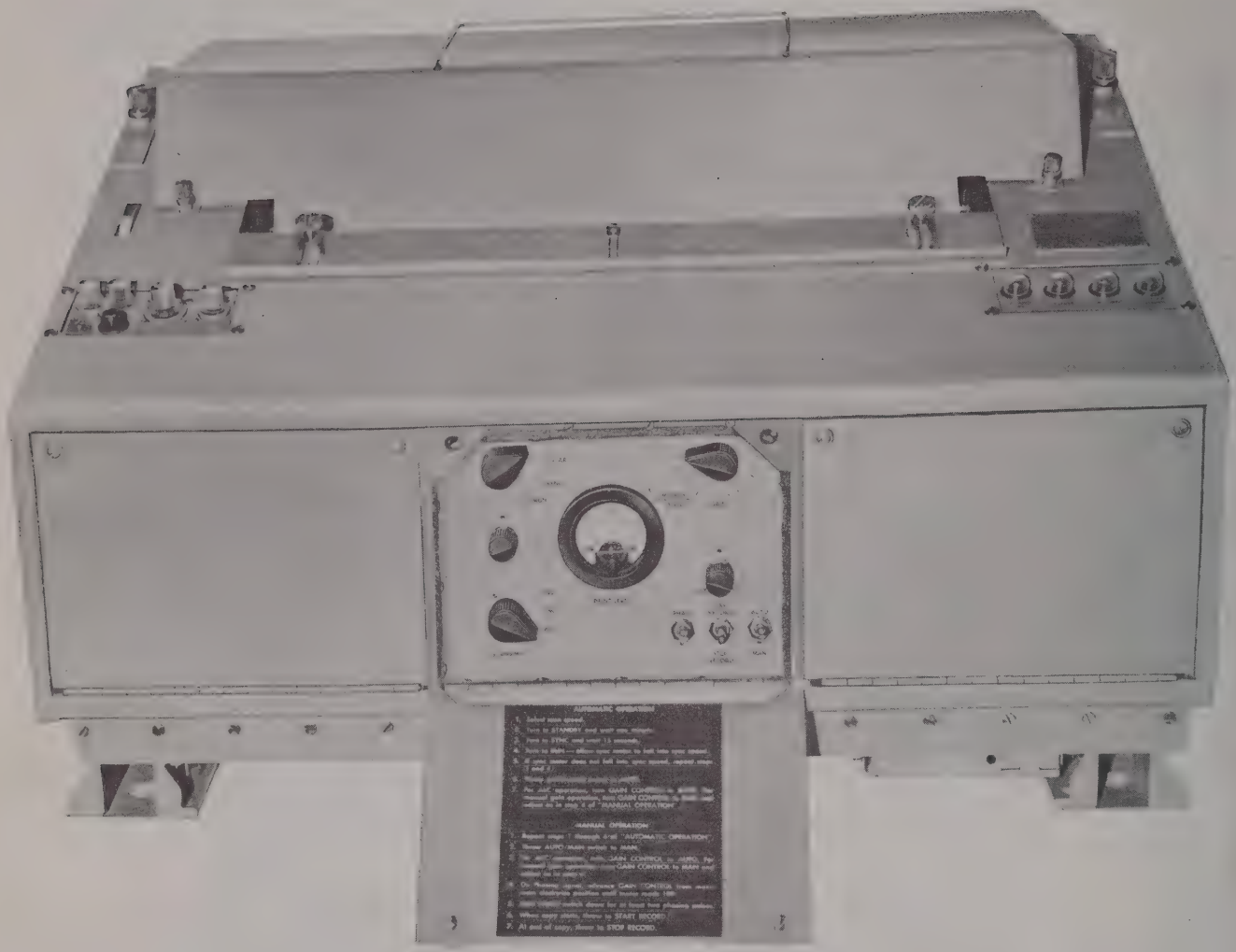


Figure 3–3. Recorder Set, Facsimile AN/UXH-2, Front View, Control Panel Door Open

(10) CONE LOCK LEVER.–The lever on the right side of the mech unit (figure 3–2) is used in the RELEASE position to release the lock on the right paper support cone when inserting a roll of recording paper. Once the recording paper roll has been inserted, the lever is left at OPERATE to lock the paper support cone in position and prevent external sources of vibration affecting the paper feed rate.

(11) PAPER FEED LEVER.–The PAPER FEED lever (figure 3–2) is used when reloading paper to lift the front and engage the back pressure rollers so that a new roll of paper may be fed around the drum.

(12) LATCH.–The LATCH (figure 3–2) is used as a catch to hold the spring-loaded PAPER FEED lever in a position which lifts the pressure rollers off the drum.

b. INDICATORS (figure 3–3).

(1) POWER ON.–The green indicator on the left side of the sloping panel is a pilot light which glows when power is on (selector switch in any position other than OFF).

(2) BLOWN FUSE INDICATORS.–Each of the fuses on the left side of the sloping panel – the two LINE fuses, the B+ and BLOWER MOTOR fuses – are held in a fuseholder which includes a neon indicator which lights when the corresponding fuse has blown.

(3) STAGE OF OPERATION INDICATORS.–The STAND BY, PHASE and RECORD indicators at the right of the sloping panel indicate at what stage the equipment is operating. The STAND BY light glows when the equipment has been turned on until start signal is received; the PHASE indicator glows while phasing signals are being received; and the RECORD light is lit when copy signals are being recorded.

(4) END OF PAPER.–This indicator lights when the recording paper has been used up.

(5) PRINT LEVEL.–The meter in the center of the control panel (figure 3–1) indicates the signal level at the print amplifier tubes V5 and V6, and is used in conjunction with the GAIN control to set the printing level for optimum recording when it is not practicable to use the automatic level setting circuit.

c. SEQUENCE OF OPERATION.

(1) BEFORE USE.—Always check the paper supply at the beginning of a day's operation or when initially turning the set on. On equipment operating at 60 scans/min., a full 450 foot roll of recording paper will last for 150 hours of operating time (450 12-inch weather charts). Instructions for changing the paper roll are given in paragraphs 3–6*b* and 3–6*c*.

Determine whether automatic or manual operation will be used and what the scanning speed of the transmitter is, and put the AUTO/MAN and SCANS/MIN switches in their appropriate positions.

If possible, determine before the transmission if the automatic level control circuit will be used. When recording by radio, or when there are large white areas between lines of copy (as in widely spaced typing), the background may print between the copy lines if the ALC is used. In these cases it is preferable to set the GAIN control for optimum printing, as described in paragraph 3–3*c*(2)(*b*). In other cases, regardless of whether the equipment is operated automatically or manually, the GAIN control should be set at the full counterclockwise AUTO position and the equipment will automatically adjust for optimum printing level.

To initially start the recorder, proceed as follows:

(*a*) Turn the selector switch to STAND BY and wait for the STAND BY indicator to light.

(*b*) Turn the selector switch to START position. Wait about 5 seconds for the start motor to bring the synchronous motor above synchronous speed.

(*c*) Turn the selector switch to SYNC position. Wait until the synchronous motor is again running above sync speed.

(*d*) Turn the selector switch to RUN. The blower motor will come on and the sync motor will coast down into sync speed. If the motor does not lock in at sync speed, turn the selector switch back to SYNC position and repeat step (*c*).

If the equipment has been stored for a long time under conditions of high temperature and high humidity, feed five feet of recording paper out of the equipment with the manual paper advance wheel before starting to record copy.

(2) DURING USE.

(*a*) AUTOMATIC OPERATION.—If automatic operation is utilized compatible automatic control signals must be received along with the facsimile signals. Set the AUTO/MAN switch and GAIN control in AUTO position. The operator may leave the equipment unattended. When start signals are received, the STAND BY light will go out and the PHASE light will come on. After the start signal, 15 seconds of phase pulses are required to enable the recorder to automatically position the stylus needles so that the edge of the recording is properly related to the edge of the paper. The phasing operation may be identified by a short buzzing sound in the recorder followed by a click (once per second at 60 scans per minute and twice per second at 120 scans per minute corresponding to the dips in the meter). When the start record signal is received, the PHASE light will go out and the RECORD light will come on. The run motor starts and sets the stylus band in motion, and the facsimile signals are recorded. The automatic level control will adjust for optimum print level during the phasing period and will compensate for any ordinary change in level during the transmission. A variation in printing density can be effected by adjusting the DENSITY control on the front panel. When the transmission is complete, stop signals from the transmitter will automatically stop the recording mechanism. The RECORD light will go out and the STAND BY light will come on. The equipment will then be in stand by condition and will wait until the next transmission automatically starts the recording mechanism again. If the equipment will be run for more than an hour without the recorded copy being torn off, the recording paper must be allowed to fall to the floor behind or in front of the machine.

The recorder may be stopped at any time during the recording by pressing the STOP RECORD switch on the front panel.

(*b*) MANUAL GAIN ADJUSTMENT.—If receiving from a radio circuit or if the type of copy (large white areas between lines of information) makes use of the automatic level control impractical, the gain can be controlled by the operator, regardless of whether the other features of the recorder are working automatically or manually. The GAIN control should be adjusted on phasing signals for a reading of 100 on the meter. This is necessary because the control circuits will not function with too low a meter reading.

(*c*) MANUAL OPERATION.—In case the transmissions are coming from a transmitter incapable of sending the necessary control signals, the recorder can be phased, started and stopped by manually operated switches, and the loudspeaker used for monitoring. For manual operation, throw the AUTO/MAN switch to MAN and wait for at least three phasing pulses. These can be heard in the monitor speaker as a high level signal with periodic interruptions. They can also be recognized on the front panel meter as previously described. When phasing is coming in, hold the PHASE switch down for at least three phasing pulses. Copy signals follow immediately after the phasing pulses. When copy signals start the monitor speaker makes a repetitive scratching noise with a repetition rate of once per scan line. The front panel meter will have erratic movement, and a much smaller deflection than on phasing. At the beginning of copy signals throw the START RECORD/STOP RECORD switch to START RECORD to start the recording mechanism. The RECORD indicator will light. At the end of transmission when the copy signals stop, press the START RECORD/STOP RECORD switch to STOP RECORD. The recording mechanism stops, the RECORD light goes out and the STAND BY light comes on.

Note

For manual operation the speaker monitor volume may be turned to maximum between transmissions to alert the operator when the next transmission starts.

As in automatic operation, if the equipment will be run for more than an hour without the recorded copy being torn off, the recording paper must be allowed to fall to the floor behind or in front of the machine.

(*d*) TO REMOVE RECORDED COPY.—The tear-off strip must be locked into the position which provides only a small slot where the recorded copy emerges from the recorder. The screw at each end of the strip must be loosened and the strip slid back if the slot has been open to view the recorded data at the recording point. Advance the recorded copy with the paper advance wheel until the end of the copy is above this tear-off strip. Hold the copy in the upper right corner and pull the paper forward and down toward the left, tearing it off against the edge of the tear-off strip. This tear-off strip should be left in this position except when it is necessary to view the recorded data as it is being received.

(3) AFTER USE.—If the AUTO/MAN switch and GAIN control are left in AUTO, the equipment will record successive transmissions until the recording paper has been exhausted when receiving facsimile signals which have the proper automatic control tones in correct sequence to start and stop the recorder on each transmission.

If the AUTO/MAN switch is left in MAN, the operator will have to phase, start and stop the recorder for each transmission.

In either case, between transmissions the equipment may be left with the selector switch at RUN and the recorder awaiting the next transmission (the STAND BY light on).

d. PRECAUTIONS.—The trolley bar and stylus needles are high voltage points. Always turn the selector switch to STAND BY before opening the cover of the mech unit (Recorder, Facsimile RO-76/UXH-2).

If the recording paper is not feeding properly, the needles may be damaged and the paper torn. Make sure the paper is feeding straight and square, with no wrinkles or bulges, and that it is under the deflector plate (see paragraphs 3–6*b* and *c*.).

e. RADIO OPERATION OF AN/UXH-2. For radio operation, the Recorder Set, Facsimile AN/UXH-2 is used in conjunction with a Frequency Shift Converter CV-172A/U. The output of the converter is fed to the input of the recorder set. At 120 scans/min. the copy may be degraded unless the frequency shift converter is modified. If the frequency shift converter is located near the recorder and the lines between the two are permanently connected, use manual GAIN. If, on the other hand, the output of the CV-172A/U is sent over a wire line for some distance or is connected between different converters, set the GAIN control in AUTO position.

f. AUDIO FREQUENCY SHIFT FROM LAND LINES.—It is possible that under an unusual combination of level change and noise on a wire line circuit, better copy will be received using audio frequency shift than amplitude modulation. The procedure for use is the same as described in NAVSHIPS 91628 using the Frequency Shift Converter CV-172A/U on the receiving end.

3–4. SUMMARY OF OPERATING PROCEDURES.

a. CHECK INSTALLATION.

CAUTION

Selector switch should be in OFF position.

(1) Signal leads connected to rear terminal board.

(2) LINE VOLTAGE switch in correct position and the lead to the left side of TB601 pin 5 or pin 6 is on the proper terminal for the available AC power supply (see paragraph 2–4).

(3) Power cable plugged into appropriate power source outlet.

(4) Check paper supply.

b. START EQUIPMENT.

(1) Select scanning speed.

(2) Turn selector switch to STAND BY and wait approximately one minute for tubes to warm up.

(3) Turn selector switch to START; wait a few seconds for start motor to operate.

(4) Turn selector switch to SYNC and wait a few seconds for start motor to bring the sync motor above synchronous speed.

(5) Turn selector switch to RUN and allow sync motor to coast down into synchronous speed.

(6) Repeat steps (4) and (5) if the sync motor does not fall into synchronous speed.

c. SET GAIN CONTROL.—AUTO gain control may be used with either AUTO or MAN control of the phasing and recording.

(1) If the automatic level control circuit is to be used, set the GAIN control in AUTO position. The gain of the recorder will automatically be adjusted for optimum recording. The desired recording density may be set with the DENSITY control.

(2) Automatic operation without ALC Circuit. When phasing signals are being received, advance GAIN control until meter reads 100.

d. SET AUTO/MAN SWITCH.—Turn AUTO/MAN switch to AUTO or MAN.

(1) AUTO/MAN switch at AUTO. (Used when facsimile signals have proper automatic control tones). The operator does not have to attend the machine.

(2) AUTO/MAN switch at MAN.

(*a*) Adjust GAIN control as described in paragraph *c* above.

(*b*) When phasing signals are being received, hold PHASE switch down for a few seconds until the buzzing sound stops. This sound should stop at the time one of the phasing pulses is received (indicated by a momentary dip of the meter). If the PHASE switch is held down longer, there should be a click which corresponds to each phasing pulse.

(*c*) Throw START RECORD/STOP RECORD switch to START RECORD when copy signals start (identified by erratic movement of meter needle).

(*d*) At end of transmission, throw START RECORD/STOP RECORD switch to STOP RECORD.

(*e*) If the equipment will be run for more than an hour without the recorded copy being torn off, allow the recording paper to fall to the floor behind or in front of the machine.

e. TURNING EQUIPMENT OFF.

(1) If more recordings are expected, leave the selector switch at RUN. The AN/UXH-2 will start to record automatically on receipt of next transmission if set for AUTO operation, otherwise the operator can proceed as in paragraph *d* (2) for the next transmission.

(2) If no more recordings are expected, turn selector switch to OFF.

(3) Remove recordings by advancing paper with the paper-advance knob and pulling one edge of the paper down along the tear-off strip.

3—5. EMERGENCY OPERATION.

There are three alternatives to complete automatic operation of the AN/UXH-2: (1) automatic starting, phasing and stopping with manual level control; (2) manual starting, phasing and stopping with manual level control; and (3) manual starting, phasing and stopping with automatic level control. These three procedures are summarized in paragraph 3—4.

It is recommended that the operator familiarize himself with the principles of operation, Section 4. The methods described in these emergency operation paragraphs are basically fundamental. The problems that could arise in the field and their solution is left, to some extent, to the ingenuity of the operator.

The faulty section of the circuit can sometimes be located by visual methods such as using the test buttons and the indicator lights as described in table 5—1, and examining the recorded copy.

a. FAILURE OF RELAYS K101 and K102.—If the recorder will not start and stop recording in response to either the proper automatic control tones or when the START RECORD/STOP RECORD switch is used, it is possible to achieve this control by disabling relays K101 and K102.

To disable relay K101, remove tube V102.

To disable relay K102, connect a jumper wire with a 15,000 ohm resistor, 5 watts or better, between TP#3 and TP#5. This connects the plate side of the relay coil to ground and the relay is conducting continually.

After the relays have been locked in their recording position, the machine can be stopped and started by turning the selector switch from RUN to SYNC and vice versa.

There is no method for phasing if that section of the circuit should fail. The result of such a condition would be that the copy would be split in two sections. If it is necessary to use the copy as one page, cut the copy along the clamp bar recorded line and fasten the two sections together with transparent tape.

CAUTION

Do not push the PHASE switch down when operating under these conditions.

b. FAILURE OF THE START MOTOR.—The mechanical system can be brought up to sync speed without the start motor by throwing the START RECORD/STOP RECORD switch to START RECORD and allowing the run motor to bring the sync motor up to sync speed. It may be necessary to increase the run voltage by increasing the RUN MOTOR ADJUST controls R130 (for 60 scans), R131 (for 90 scans) or R132 (for 120 scans) temporarily while starting the recorder. Return control to its original position (see paragraph 6.3-2*b*, *c* or *d*).

c. FAILURE OF RUN MOTOR SPEED CONTROLS.— If the run motor speed adjustment controls (R130, R131, and R132) fail, connect a jumper between pin 2 of K2 and TP#15. This will apply the full line voltage to the run motor. By loading up the brushes on the mech unit, MP103 figure 6—5, the torque can be somewhat reduced to allow a reasonably good recording. If fixed resistors are available, typical values should be for 60 scans 800 ohms, 25 watts, for 90 scans 600 ohms, 25 watts, and for 120 scans 400 ohms, 25 watts. These are approximate values only.

Copy transmitted at ~~120~~ 60 scans can be recorded in the ~~60~~ scan position. The difference will be that you will get two copies of half the original size.

3—6. OPERATOR'S MAINTENANCE.

a. CHANGING THE STYLUS NEEDLES.—A stylus needle will normally last for a little more than two rolls of paper (two weeks under normal 24 hour-a-day operating conditions). A stylus should be changed when it wears down to the brass shoulder, when it is bent, or when it does not register properly along the scanning line, causing gaps or streaks in the printing.

To change a stylus needle, proceed as follows (see figure 4—14).

(1) Turn the selector switch to STAND BY.

(2) Loosen the two knurled screws on the top cover and the knurled screw on the sloping panel on each side of the top cover. Open the cover and pull the front portion of the cabinet forward.

(3) Loosen the three knurled screws that fasten the mech unit cover and lower the cover to expose the stylus band and needles.

(4) Rotate the right hand wheel clockwise until the stylus holder is outside the path of the trolley bar.

(5) Carefully lift the fine spring wire out of the slot and remove the stylus needle with a rotating motion. Do not force the leaf spring and holder out of position.

CAUTION

Care should be taken not to deform the spring wire in any way.

(6) Use the stylus needle gage to check and straighten the stylus needle as described in paragraph 3–6*f* or save the needle for straightening later.

(7) Insert the new needle with a rotating motion. The flattened end of the stylus head must be turned away from the band.

(8) Carefully replace the spring wire into the slot.

b. LOADING A NEW ROLL OF PAPER.

Note

Follow the instructions in this paragraph when there is some recording paper remaining in the machine. If there is no roll of paper in the machine, follow "Loading of a New Roll of Paper into an Empty Machine" instructions in paragraph 3–6*c* below.

(1) With the selector switch in STAND BY position, loosen the two knurled screws on the top cover and the knurled screw on the sloping panel on each side of the top cover. Open the cover and pull the front portion of the cabinet forward.

(2) Turn the top of the old roll toward the front of the recorder to create slack in the paper.

(3) Tear or cut paper behind the feed roll.

(4) Release the lock on the right hand paper support cone by pushing the CONE LOCK lever to RELEASE.

(5) Grasp the old roll firmly and press it against the right spring-loaded paper support cone until the left end of the roll core is free from the left paper support cone. Tilt the left end of the old core upward and remove it from the machine.

(6) Remove the wrapper from the new roll and holding it so that the top unrolls toward the front of the recorder, place the right end of the core onto the right paper support cone.

(7) Press to the right until the left side of the core can be slipped down onto the left paper support cone.

(8) Unroll about a foot of the new paper and slip the free end of the new roll between the remaining piece of the old paper and the feed drum.

(9) Return the CONE LOCK lever to OPERATE.

(10) Push the PAPER FEED lever back until it engages the LATCH.

(11) Rotate the paper advance knob upward until the piece of the old roll comes out of the machine and the new paper comes completely around the drum and up past the tear-off bar.

(12) Push the LATCH to release the PAPER FEED lever and return the lever to a neutral position (where the front rollers are just off the drum). Pull on the free end of the paper to remove any wrinkles that may have formed and to square up the paper.

Note

Make sure the left hand end of the paper is safely behind the edge of the stylus deflector plate (figure 4–10). If the edge of the paper is not under the deflector plate, the stylus needles will be damaged and the paper torn.

(13) Return the PAPER FEED lever to its normal position and advance the paper with the paper advance knob to check that it is feeding smoothly and square.

c. LOADING A NEW ROLL OF PAPER INTO AN EMPTY MACHINE.

Note

Follow the instructions in this paragraph if there is no recording paper in the machine. If there already is a roll of paper in the recorder, follow the procedure outlined in paragraph 3–6*b* above.

(1) With the selector switch at STAND BY, loosen the two knurled screws on the top cover and the knurled screw on the sloping panel on each side of the top cover. Open the cover and pull the front portion of the cabinet forward.

(2) Lower the front cover of the mech unit and remove the stylus needle which is contacting the drum (see paragraph 3–6*a* above).

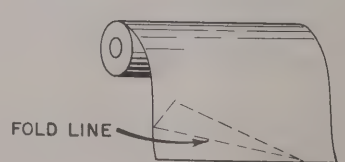
(3) Push the CONE LOCK lever to RELEASE, releasing the lock on the right hand paper support cone.

(4) Push the core of the old roll of paper to the right until the left end of the core is clear of its support cone. Tilt the left end upward and remove the old core from the machine.

(5) Remove the wrapping from the new roll, and holding the roll with the top unrolling toward the front of the recorder, center the core of the roll onto the right hand cone. Push to the right until the left side of the core can be slipped down onto the left paper support cone.

(6) Return the CONE LOCK lever to OPERATE.

(7) Pull out about one foot of paper from the roll. If the leading edge of the paper is not already trimmed, fold the edge of the paper back diagonally as shown, or trim to indicated angle with scissors.



(8) Slip the leading edge of the paper between the rear of the paper feed drum and the paper guide.

(9) Push the PAPER FEED lever back until it engages the LATCH.

(10) Turn the paper advance knob upwards; this feeds the paper behind the trolley bar and under the front pressure rollers (figure 4–15). Keep paper slack in rear by turning paper roll by hand.

(11) Push the LATCH to release the PAPER FEED lever and return the lever to a neutral position (where front rollers are just off drum) and pull on the free end of the paper to remove any wrinkles that may have formed and to square up paper.

Note

Make sure left hand edge of the paper is safely behind the edge of the stylus deflector plate (figure 4–10). If the edge of the paper is not under the deflector plate, the stylus needles will be damaged and the paper torn.

(12) Return the PAPER FEED lever to its normal position and advance the paper with the paper advance knob to check that it is feeding smoothly and square.

(13) Replace the stylus needle and close the equipment.

d. CHANGING THE STYLUS BAND.–Changing the band is not normally an operator function, but in an emergency may be accomplished as follows:

(1) With the selector switch at STAND BY, loosen the two knurled screws on the top cover and the knurled screw on the sloping panel on each side of the top cover. Open the cover and pull the front portion of the cabinet forward.

(2) Loosen the three knurled screws that fasten the mech unit cover and lower the cover to expose the stylus band.

(3) Remove the stylus needles from the band as described in paragraph 3–6*a* above.

(4) Holding the lower section of the band with both hands, gradually pull the band outward and off the left wheel while rotating the band clockwise. The band assembly will roll off the wheels. Be careful that the stylus bushings do not catch in the paper guide fingers (figure 4–10).

(5) To replace the band, hold it in both hands and place it completely around the left wheel.

Note

Position the band so that the end of the sync arm with the white dot is in front of a complete stylus assembly when moving in a clockwise direction (figure 4–10) and so that the groove on the under side of the band fits the wire on the wheel.

(6) Holding the band on the left wheel with the left hand, place the free loop of the band over the front edge of the top of the right wheel with the right hand. Continue to hold the band on the left wheel while maintaining the top strand fairly taut to prevent catching the paper guide fingers.

(7) Work the band around the right wheel. When it becomes tight, turn the wheel clockwise and press the band onto the bottom of the right wheel. Inspect both wheels to make sure the wire is engaged in the groove.

(8) Reinsert the stylus needles and close the equipment.

Note

Check the first copy to see if the phase position is correct. If it is not, remove the band and repeat the above process.

e. STYLUS HOLDER ALIGNMENT.–Before attempting to adjust a stylus holder assembly, make sure it is definitely out of alignment (index). Stylus holder misalignment will cause jitter of vertical lines in the recorded copy (see figure 5–1C). Study the recording. If one of the recorded lines are repetitively out of line, a stylus holder is probably misaligned or a stylus needle is bent. Stylus needles which are known to be straight (see paragraph 3–6*f*) should be inserted in each of the stylus holders and a copy recorded again before attempting to realign the stylus holders.

Since a damaged leaf spring (figure 4–14) may also cause recording defects, examine the leaf springs in each of the stylus holder assemblies before attempting to align the stylus holders. (See paragraph 6.3–4*b* (3) for instructions on how to replace the leaf spring.)

There is a fixture (figures 3–4 and 3–5) inside the top of the cabinet hood which can be used to align the stylus holders.

Note

When one stylus holder assembly is aligned, the other two on the band should be aligned with the same fixture.

Refer to figures 3–4 and 3–5.

(1) Remove the needles from the band as described in paragraph 3–6*a* and remove the band from the recorder, paragraph 3–6*d*.

(2) Remove the fixture from tool box and unscrew alignment pin F from its storage hole J.

(3) Open the jaws of the fixture by loosening knurled screws A and B one to one and a half turns each.

(4) Loosen the two screws H slightly, but do not remove them.

(5) Holding the fixture with the round head screw on top, insert the band between the jaws of the fixture in the lower slot so that the nylon block is between the fingers of the clamp as shown in figure 3–5. Make sure the guide wire C is engaged in the groove on the under side of the band.

(6) Slide the band to the right (direction of arrow, figure 3–5) until the band lug is in contact with indexing pin D.

(7) Holding the band in this position, firmly tighten knurled screw B. Check that the lug is against the indexing pin and the guide wire is in the groove on the underside of the band before proceeding.

(8) Insert alignment pin F through the center hole in stylus bushing G, fixture bushing E, and out through the hole on the other side of the fixture as shown in figure 3–5, so that the shoulder of pin F brings the stylus bushing in contact with the fixture bushing.

(9) Holding the alignment pin in this position, firmly tighten knurled screw A.

(10) Tighten the two screws H; do this with care so as not to strip the threads in the nylon block.

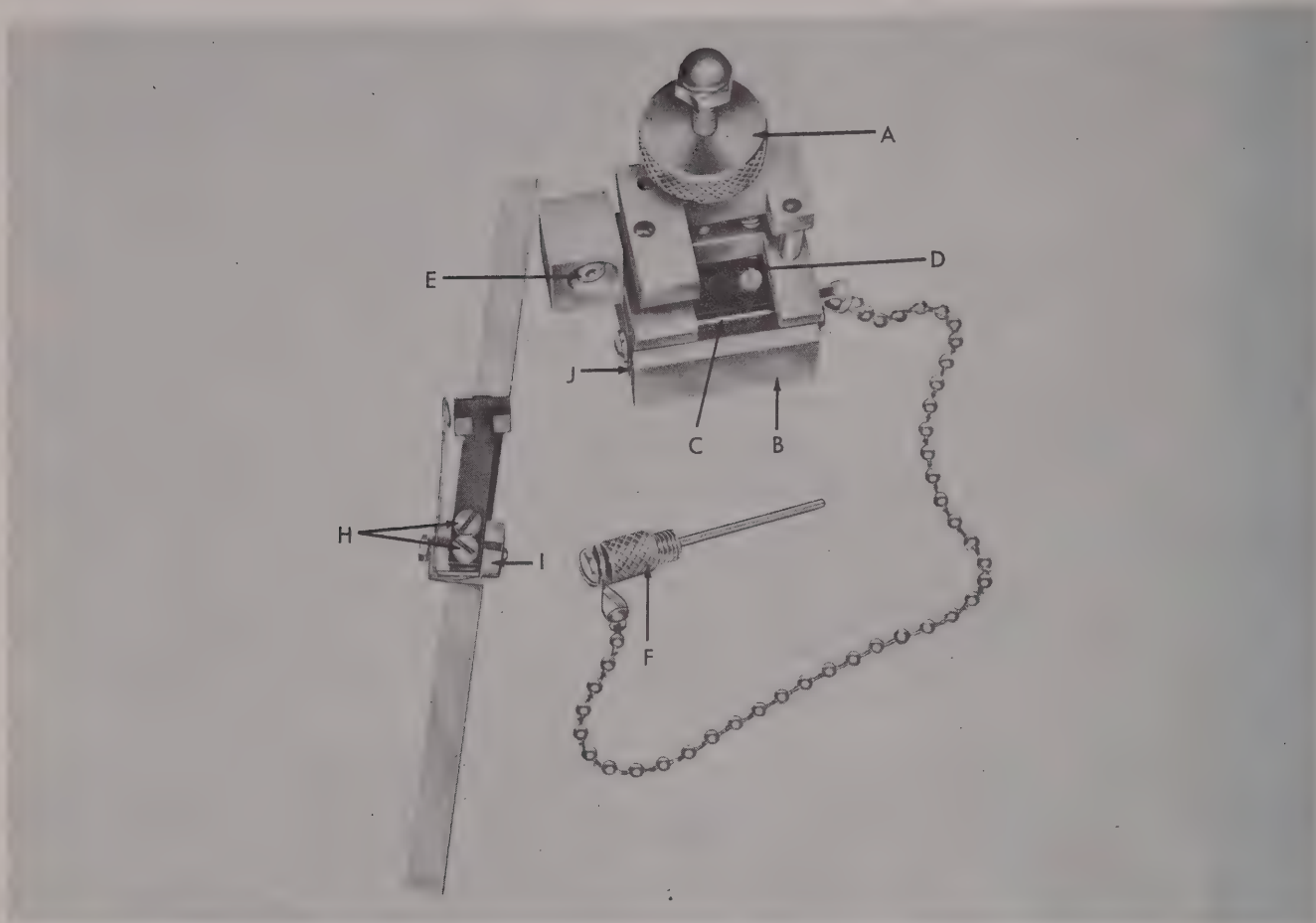


Figure 3–4. Stylus Holder Alignment Fixture

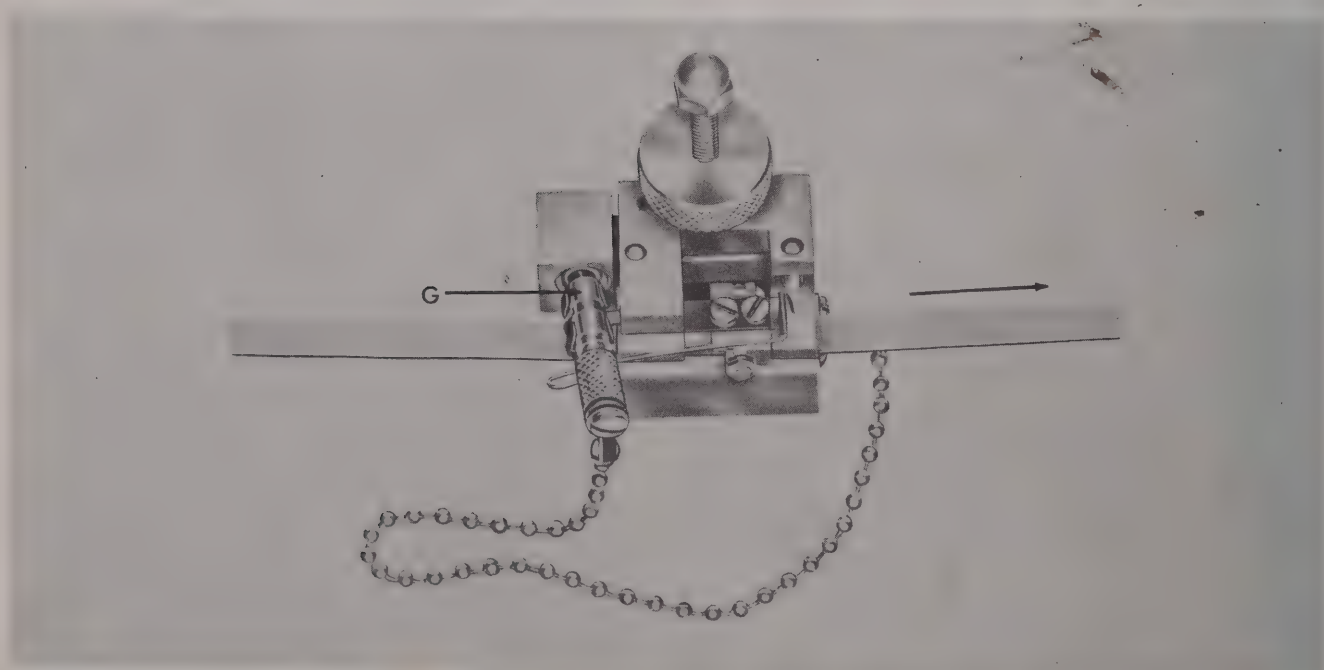


Figure 3–5. Stylus Holder Alignment Fixture, Indexing Pin Inserted in Bushings

(11) Carefully remove alignment pin F from the bushings.

(12) Loosen knurled screws A and B and carefully remove the band.

(13) Reinsert the alignment pin F into its storage hole J, and close jaws of fixture.

(14) Replace the band on the recorder (paragraph 3—6*d*).

Check the alignment again by recording several inches of copy.

f. CHECKING AND STRAIGHTENING THE STYLUS NEEDLES.—The stylus gage (in the tool box under the cabinet hood) (figure 3—6) consists of a lens A and lens barrel B, a sleeve and flange assembly C with a hole D to accommodate the stylus needle, and an adjustable screw E with a knurled head.

To check the straightness of a stylus needle, sight through the lens A towards a light background. (The focus of the lens piece may be adjusted by moving it in or out). Turn the adjusting screw E so that the end is slightly back from center. Insert the stylus needle into the hole in the bushing on the flange and adjust the screw inwards until it is almost touching the needle. Rotate the stylus needle and check for straightness, using the end of the screw as a visual aid.

If the stylus wire is not straight, rotate the stylus so that the bend is towards the screw. Gently adjust the screw inward, bending the wire towards the center. Hold the stylus head very firmly to prevent the stylus revolving under the pressure of the screw.

Note

To allow for spring-back, it will be necessary to push the wire slightly beyond the center. After bending the stylus, check for straightness by backing off the screw slightly and rotating the stylus as described above.

Insert the stylus in its holder (paragraph 3—6*a*) and record several inches of copy to recheck the stylus.

g. REMOVING THE CARBON RESIDUE.—About once a month, remove the carbon from the tray at the bottom of the mech unit. Loosen the two knurled screws (lower front of the mech unit), slide the tray out, shake out the carbon and return the tray.

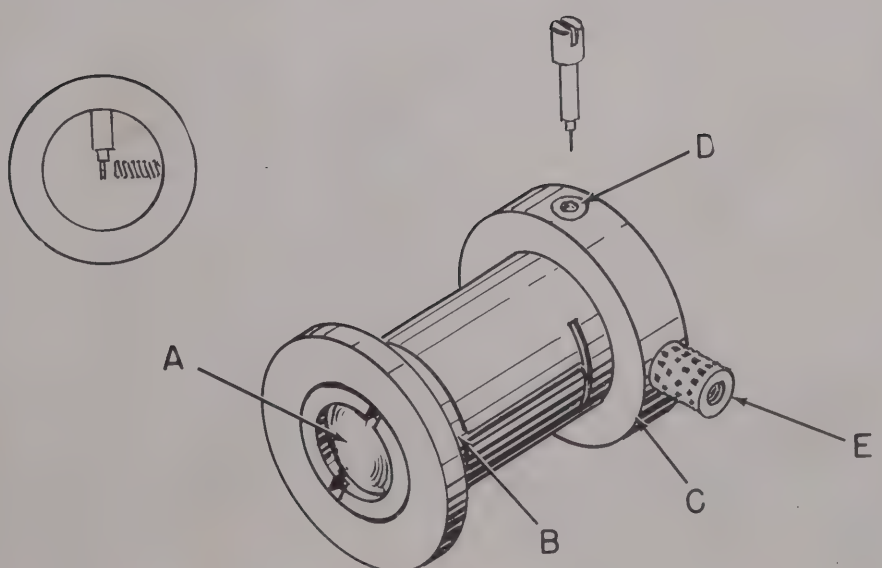


Figure 3—6. Stylus Needle Gage

b. CHANGING THE ACTIVATED CARBON.—If a canister assembly is used on the rear of the equipment, the activated carbon should be replaced after three months of operation. Replacing the carbon is not ordinarily an operator function, but may be accomplished as follows:

(1) Loosen the two captive screws on each side of the bracket on the rear of the cabinet (figure 3–7).

(2) Lift the filter and canister up off the mounting bracket.

(3) The filter separates from the canister. Cleaning the filter is described in paragraph 3–6*i*.

(4) Remove the canister cover by taking out the two screws.

(5) Shake out the activated carbon and replace with a fresh supply. If no carbon replacement is available, the carbon may be renewed by holding the canister away from the equipment and shaking the canister to expose fresh surfaces of the activated carbon.

i. CLEANING THE FILTERS.—There are four aluminum wire filters, one on each side of the cabinet beneath the mech unit (figure 3–2), one in the center of the mèch unit casting (figure 6–5), and one in the canister assembly on the rear of the cabinet (figure 3–7). Cleaning the filters is not usually an operator function, but when necessary, they should be removed from the equipment as described below, and soaked in a grease solvent such as Type II, P-S-661; then dip them in an oil such as listed in table 6–4 and let them drain for twenty-four hours before replacing them in the equipment.

(1) REMOVING FILTERS FL602 and FL603 FROM BENEATH THE MECH UNIT (figure 3–2).

(*a*) Open the cabinet and pivot the front portion forward.

(*b*) Loosen the two wing bolts holding each filter.

(*c*) Close cabinet and slide filters out from below the front of the equipment.

(2) REMOVING FILTER FL501 IN CENTER OF MECH UNIT CASTING (figure 6–5.)

(*a*) Open cabinet and pivot front portion forward.

(*b*) Loosen the two knurled filter frame captive screws and pivot frame forward.

(*c*) Loosen the two wing bolts and reach into frame and pull out filter.

(3) REMOVING FILTER FL604 FROM CANISTER ASSEMBLY.

(*a*) Loosen the two captive screws on each side of canister mounting bracket on the rear of the cabinet (figure 3–7).

(*b*) Lift filter and canister assembly off the bracket and separate the filter from the canister.

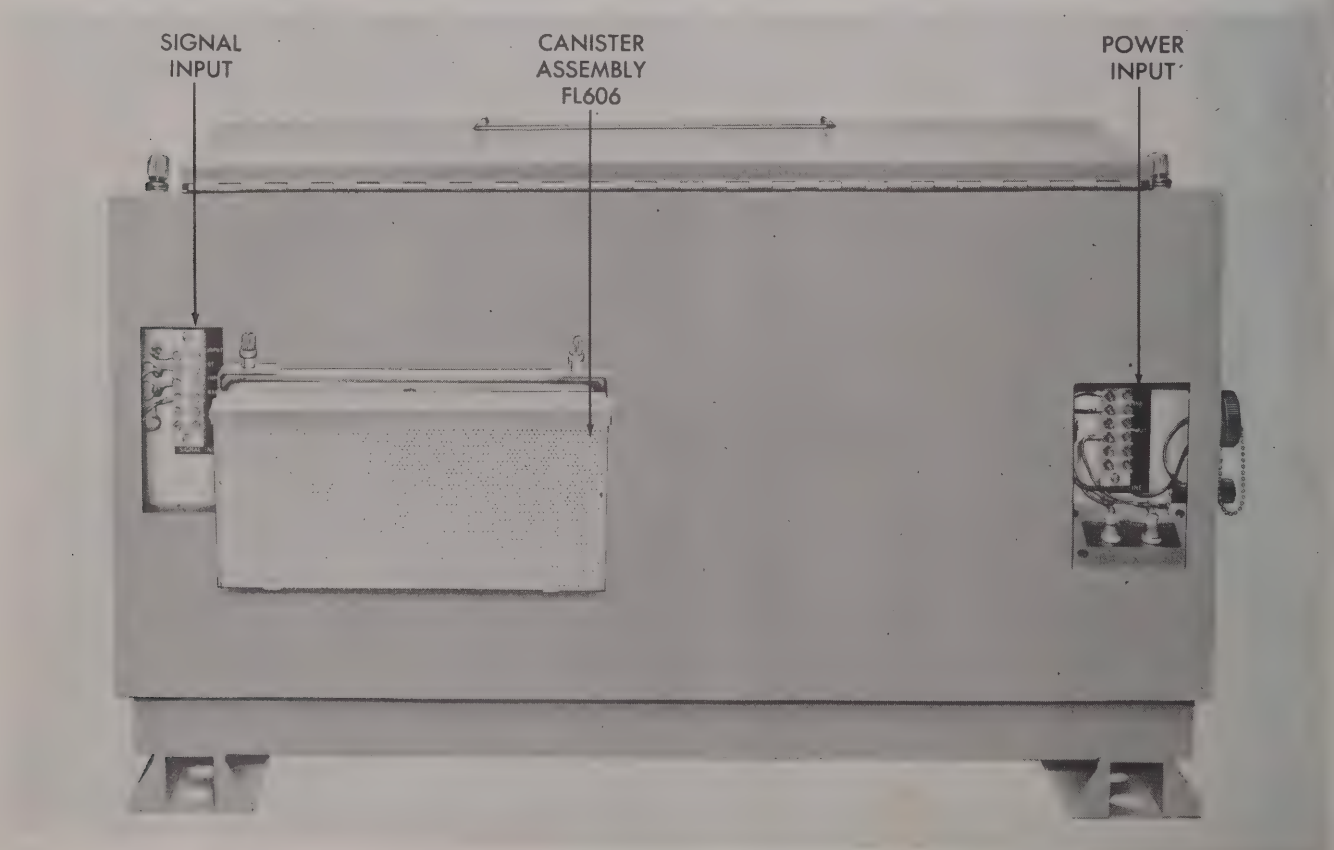


Figure 3–7. Recorder Set, Facsimile AN/UXH-2, Rear View

3–7. EMERGENCY MAINTENANCE.

a. REPLACING FUSES.—There are five fuses used in Recorder Set, Facsimile AN/UXH-2.

Four of these are in the fuseholders on the left side of the sloping panel. A 5 amp, 110 volt, type FO3G5R00A fuse is used in each side of the line for 110 volt operation. For 220 volt operation, these are replaced by 3 amp, 220 volt, type FO3G3R00A fuses. The B+ fuse is a 3/10 amp fuse and the BLOWER MOTOR fuse, a 1 amp type FO3G1R00A fuse. When the lamp in any of these four fuseholders lights, it indicates that that fuse has blown and needs to be replaced. Make sure the equipment is turned off and the light in the blown fuse indicator has gone out before attempting to replace a fuse.

On the left side of the equipment there is a 10 amp fuse, type FO3G10R0A, for the utility outlet.

Seven spare fuses (one 1 AMP, two 5 AMP, two 3 AMP, and one each 10 AMP and 3/10 AMP) are held in clips inside the front portion of the cabinet on the left side (figure 2–3).

WARNING

Never replace a fuse with one of a higher current rating unless continuous operation of the equipment is more important than the probable damage. If a fuse burns out immediately after replacement, do not replace it a second time until the cause has been located and corrected.

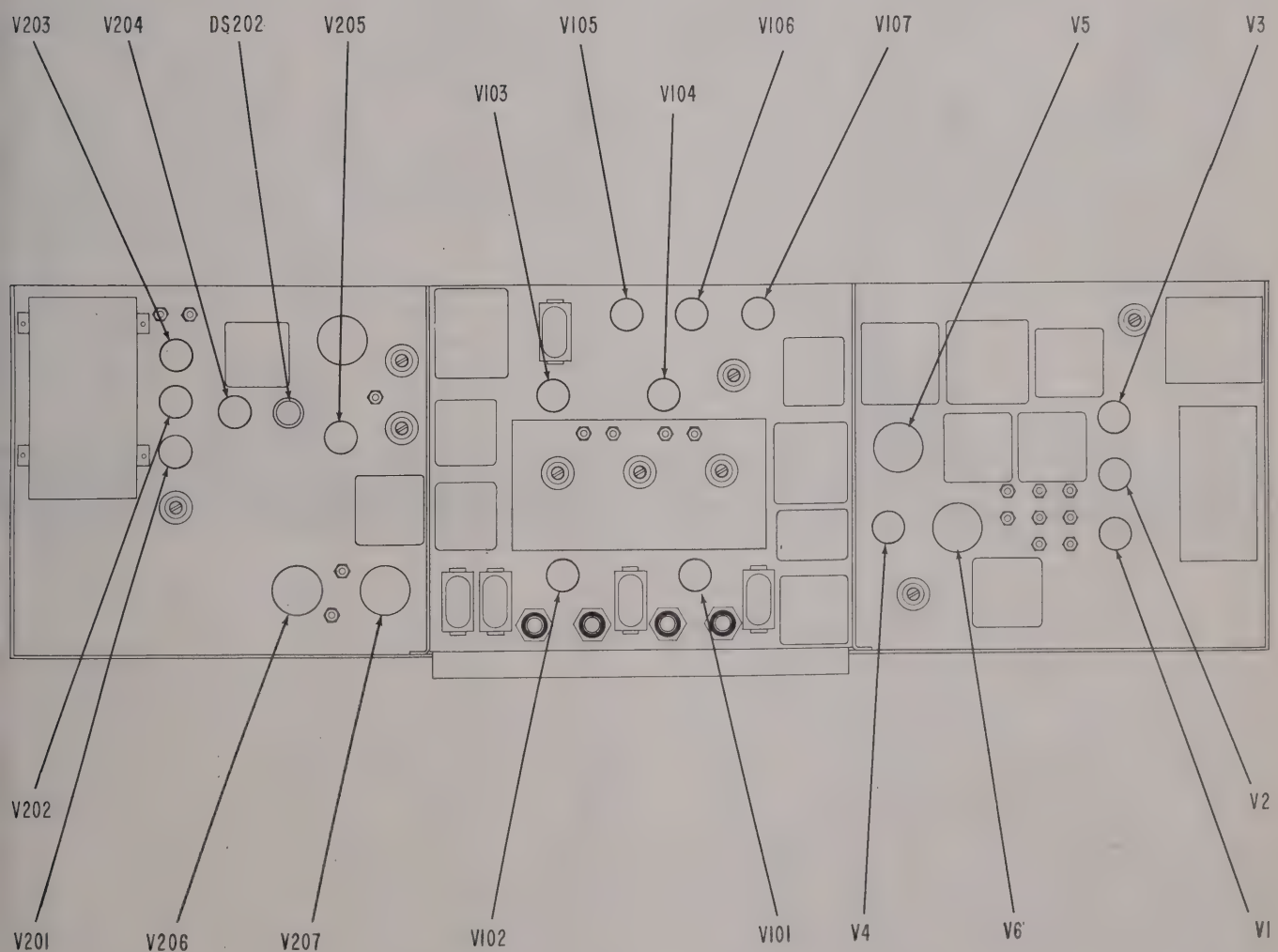


Figure 3–8. Recorder Set, Facsimile AN/UXH-2, Location of Tubes

b. REPLACING TUBES.—All the tubes of the AN/UXH-2 are located on the electrical chassis as shown in figure 3–8, and are accessible when the top cover is raised and the front portion of the cabinet pivoted forward.

WARNING

Turn off equipment and allow tubes to cool before handling. If immediate replacement is required, use a piece of cloth or an asbestos glove to remove a tube.

To replace a tube, first remove the tube retainer as shown in figure 3–9. Use a gentle rocking motion to pull the tube out. When inserting the replacement tube, align the tube pins with the socket, use a steady pressure, and push straight downward until the tube is seated properly. Replace the tube retainer.

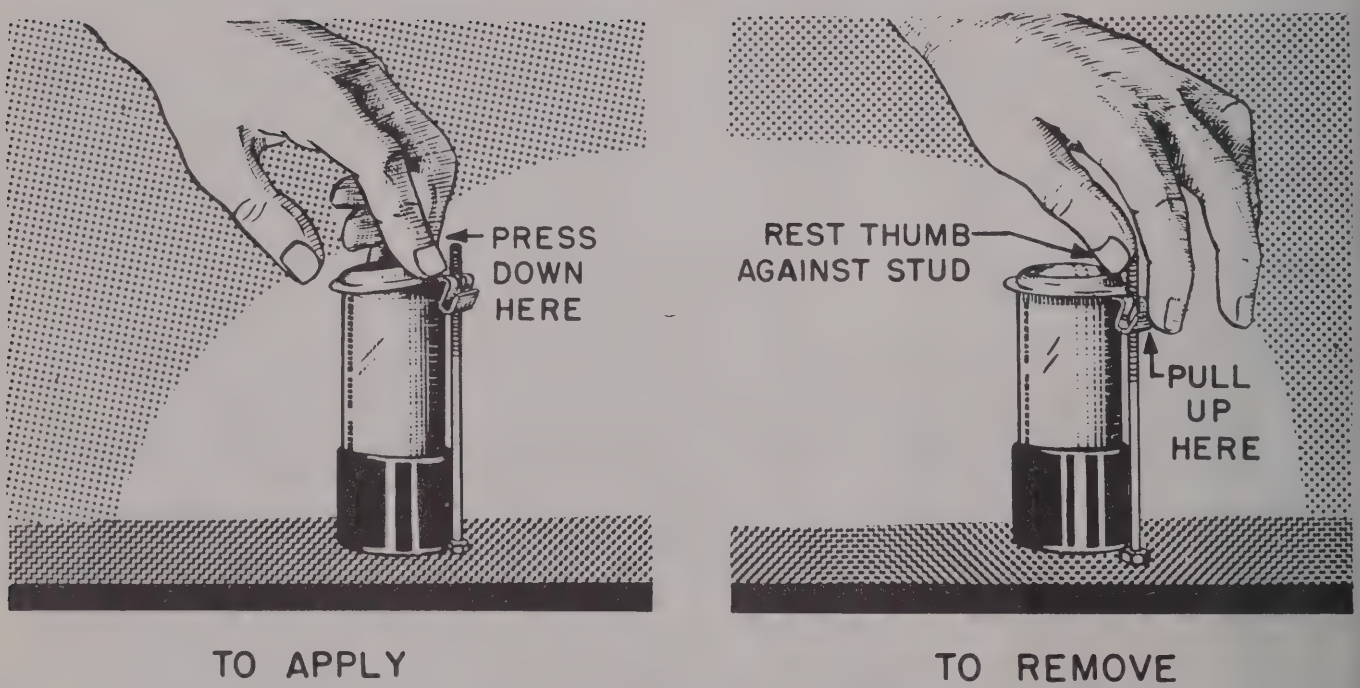


Figure 3–9. Removing Tube Retainer

SECTION 4
PRINCIPLES OF OPERATION

4–1. OVERALL FUNCTIONAL DESCRIPTION.

a. FUNDAMENTALS OF FACSIMILE.—Facsmile equipment is used to convert graphic matter into signals which may be transmitted over an electrical communications system such as a wire or radio circuit, and to reconvert these signals to a reproduction of the original at a distant point. This graphic matter (the subject copy) may be messages, pictures, photographs, sketches, typewritten and printed text, or handwriting, as well as weather maps or charts.

(1) THE FACSIMILE TRANSMITTER.—The facsimile transmitter must resolve the copy to be transmitted into very small elemental areas and transmit the average density of each area separately. The size of these elemental areas must be small enough to resolve the smallest intelligence that is to be transmitted.

An exciter lamp is used as a source of uniform illumination of the copy and a phototube is used to determine the brightness of each elemental area. The copy to be transmitted is clamped on a drum at the facsimile transmitter. An image of the copy is focused upon an aperture plate which is located immediately in front of a phototube. The size of the hole in the aperture plate determines the area of the copy image (the elemental area) which passes through to the phototube.

The phototube acts as a valve in a modulator circuit to control the amplitude of a carrier frequency or tone. When a dark area of the copy is seen by the phototube through the aperture, the phototube allows a maximum signal to pass through the modulator circuit. When a white area is seen by the phototube, a minimum signal results. This signal from the phototube modulator is the facsimile signal which is transmitted to the facsimile recorder.

In order to scan each elemental area of the copy, the drum upon which the copy is clamped rotates and at the same time moves sidewise, so that the relative position of the optical system shifts by one elemental area for each drum revolution. When the optical system has completely scanned the copy, all of the elemental areas on the copy have been seen by the phototube and a signal of corresponding amplitude has been transmitted for each elemental area.

(2) THE FACSIMILE RECORDER.—The facsimile recorder amplifies the facsimile signal received from the communication system and converts it back into corresponding density variations on the recording paper.

The received facsimile signal is amplified and applied to small stylus needles which are in contact with the recording paper. Three of these stylus needles are carried on a band, but only one touches the recording paper at a given time. The speed of the stylus needle at the facsimile recorder is the same as the peripheral speed of scanning at the facsimile transmitter in inches per second, because, in this particular recorder, the lengths of the scanning and recording lines are the same. One stylus needle makes a traverse of the width of the recording paper in the same time that the drum at the facsimile transmitter makes one revolution, so that if the recorder is properly phased at the start of a transmission, the recording needle is maintained in the same relative position as the scanning spot at the transmitter.

When a black area of the copy to be transmitted is seen by the phototube, a maximum amplitude signal is transmitted, amplified at the recorder, and impressed upon the recording paper by the stylus to print a corresponding elemental area of maximum density (black).

When a white area is seen on the transmitter drum, the signal passed by the phototube modulator circuit is so low that nothing is recorded in the corresponding elemental area on the paper at the facsimile recorder.

When the entire copy has been scanned at the facsimile transmitter, a facsimile of it will have been reproduced on the recording paper at the facsimile recorder.

b. FUNCTIONS OF RECORDER SET, FACSIMILE AN/UXH-2.—The AN/UXH-2 is designed for unattended operation — to automatically start at the beginning of a transmission, print the copy at the proper density and in the proper position on the recording paper, and stop when the transmission is complete. To accomplish this, Amplifier, Electrical Control AM-1845/UXH-2 detects the carrier and control signals, adjusts the signal level for optimum printing, provides a constant frequency drive for the synchronizing mechanism, and applies power to the phasing and recording components at the appropriate time. Recorder, Facsimile RO-76/UXH-2 positions the stylus needles and drives the paper and stylus needles at the right speed to intelligibly reproduce the transmitted copy on the recording paper. The blower unit cools the equipment and evacuates dust. Power Supply PP-1901/UXH-2 provides voltages for the tube heaters, B+ and bias, for proper operation of the circuits.

The circuitry sections of Amplifier, Electrical Control AM-1845/UXH-2 are the signal amplifier, automatic level control and print circuits; the automatic control circuits; the fork oscillator and sync motor drive circuits; the speaker amplifier and the test signal circuits. The speaker amplifier is connected directly to the secondary of the input transformer and is independent of the other circuits; it is used to monitor the incoming signal. The signal amplifiers and automatic level control circuits amplify and adjust the level of the incoming signal and

the print amplifiers pass the signal on to the recording stylus needles. The control circuits amplify the incoming signal and control tones to control various relay circuits which start, phase and stop the recording mechanism in response to the received signals. The fork oscillator provides a constant frequency source of 3600 cycles which is divided down to provide the correct sync motor frequency.

The Recorder, Facsimile RO76/UXH-2, has a run system to drive the stylus band, a sync system to restrain the band so that the speed of the recording stylus exactly matches the speed of the scanner at the facsimile transmitter, a phasing mechanism to place the recorded copy in the correct position on the recording paper, and a paper feed mechanism driven from the run motor.

The blower unit evacuates the air from the recording area through filters which remove the dust and through activated carbon to remove odors.

The AN/UXH-2 recorder is capable of recording double side band amplitude modulated 1800 cycle carrier such as the output of Facsimile AN/TXC-1( ) or vestigial side band amplitude modulated 2400 cycle carrier with a carrier modulation of 75% or greater and the upper side band suppressed.

The recorder will respond automatically to the following transmitted control signals:

A start signal consisting of a 300-cycle square wave modulation on the carrier, transmitted for 3 to 5 seconds.

A phasing signal consisting of the carrier, at an amplitude corresponding to the black level of the copy, which at a stroke speed of 60, is interrupted for 25 milliseconds once per second by a change to white level (black to white contrast ratio 20 db) and is transmitted for 15 seconds.

A start-record signal consisting of a 60-cycle square wave modulation of the carrier, transmitted for 3 to 5 seconds.

A stop signal, transmitted after the copy facsimile signals, consisting of a 450-cycle square wave signal modulating the carrier for 3 to 5 seconds.

These control signals are usually generated by electronic circuits in the facsimile transmitter and sent automatically whenever a facsimile transmission is made. However, they may be generated optically by scanning black and white bar patterns if the facsimile transmitter does not have provision for generating them automatically.

Figure 4–1 is an overall block diagram showing the course of the signal through the major circuits of the AN/UXH-2 and the functions of the various stages.

4–2. AMPLIFIER, ELECTRICAL CONTROL AM-1845/UXH-2.

a. THE SIGNAL AMPLIFIER, AUTOMATIC LEVEL CONTROL AND PRINT CIRCUITS (figure 4–2).—Incoming signal appears across input transformer T301. Signal from the secondary of T301 is fed through GAIN control R301 to amplifier stage V1A. If the gain control is set at AUTO position, the feedback stage V2 will control the bias on V1A&B as explained below. If manual gain control is used, switch S306, part of R301, locks out the automatic level control circuit and V1A and B are used as a straight amplifier with R301 used to adjust the amount of signal applied to V1B.

The signal from tube V1A couples through a 1:3 step-up transformer T1 to the grid of tube V2B. The output from V2B is directly coupled to cathode follower V2A which provides a low impedance source for the rectified signal. The output from V2A is fed through a filter network consisting of capacitor C4, rectifier CR1 and resistor R8. DC voltage from this network, which is proportional to signal level, is filtered by capacitor C3 and resistor R7, and applied as a bias to the grids of tube V1A and V1B. The bias will follow the maximum amplitude (black signal), automatically controlling the gain of V1A and V1B to compensate for variations in level of the received signal.

The output from the ALC transformer T2 is fed through ALC OUTPUT control R30 and potentiometer R27A to the grid of print driver stage V4A and thence to interstage transformer T3 and print tubes V5 and V6 connected as push-pull amplifiers. The grids of V5 and V6 are coupled through a resistor network which provides a high impedance input. CONTRAST potentiometer R27B is used to control the bias on the grids of V5 and V6 and is so arranged that the tubes are cut off with no driving signal. The signal must be strong enough to overcome this fixed bias before any print power is obtained. This gives a threshold limiting effect which eliminates the signal transmitted by the background of the original copy. R27A and R27B are ganged together in such a way that when the recorded copy contrast is increased by increasing the bias, the signal level is increased to maintain the same recording density. The ALC OUTPUT control R30 keeps the input to R27 within the necessary limits to permit overall adjustment of the contrast of the recorded copy.

DENSITY control R303 permits variation of the screen voltage of V5 and V6 to control print density.

Resistor R21 applies a small positive voltage to the grids of V5 and V6 to ensure their conducting when first turning the equipment on. When the recorder is standing by, phasing, or before the stylus band starts rotating, there is no plate voltage on V5 and V6 (K102 contacts 10 and 14 are open) and hence no voltage on the trolley bar until record relay K102 is energized, closing contacts 14 and 10. Resistor R231 permits the screen to act as plates and the AC voltage developed across this resistor is used to supply signal to the phasing circuit.

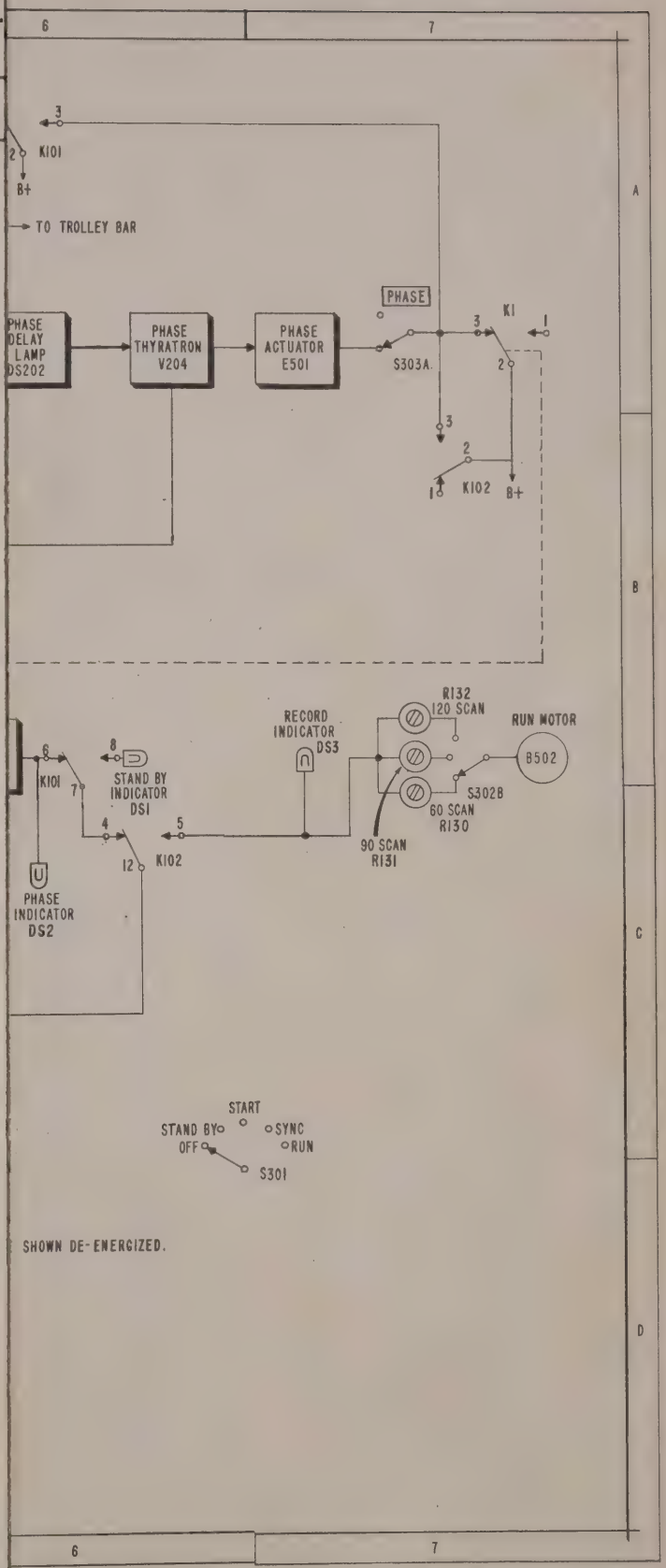
Signal from V5 and V6 is fed through output transformer T5 and 1200-ohm resistor R501 to the trolley bar and stylus needles. Transformer T5 has a 1:1.5 voltage step-up ratio which matches the impedance of the recording paper to the plate circuit of the print amplifiers. Resistor R501 acts as a current limiter. Capacitors C501 and C502 shunt some of the signal at 60 and 90 scans to ensure a relatively constant print density regardless of the recording speed.

INDEX TO PART LOCATIONS

RECORDER SET

ITEM	*LOCATION COORDINATES
ALC AMPLIFIER V1	4A
ALC CATHODE FOLLOWER V2A	2B
ALC FEEDBACK AMPLIFIER V2B	2B
ALC LOCK-OUT SWITCH S306	1A
ALC OUTPUT CONTROL R30	2A
ALC RECTIFIER CR1	2B
AUTO/MAN SWITCH S305	4A
B+ SUPPLY	4D
BIAS LIMITING RECTIFIER CR2	1B
BIAS SUPPLY	4D
BIAS VOLTAGE REGULATOR V107	4D
BLOWER B401	5C
BLOWER FUSE F204	5C
CAPACITORS C213, C214	6A
CAPACITORS C501, C502	6A
CONTRAST CONTROL R27	3A, 5A
DENSITY CONTROL R303	5A
END OF PAPER INDICATOR DS4	4C
END OF PAPER SWITCH S501	4C
FORK, 3600 CPS, Y201	1C
FORK AMPLIFIER V201	1C
FORK CONTROL R221	1C
FORK FEEDBACK AMPLIFIER V202A	2C
FORK SIGNAL AMPLIFIER V202B	2C
FORK SIGNAL LIMITER CR201	1C
GAIN CONTROL R301	2A
HIGH PASS FILTER FL103	3A
INPUT TRANSFORMER T301	1A
LINE FILTER FL601	1D
LINE FUSES F201, F202	1D
LINE VOLTAGE HIGH/LOW SWITCH S401	3C, 3D
LOCKED OSCILLATOR V203	2C
MOTOR CONTROL R222	3C
PHASE ACTUATOR E501	7A
PHASE ADJUST CONTROL R236	5B
PHASE AMPLIFIER V205A	5A
PHASE DELAY AMPLIFIER DS202	6A
PHASE INDICATOR DS2	6C
PHASE SWITCH S303	4A, 7A
PHASE THYRATRON V204	6A
POWER ON INDICATOR DS201	4C
POWER TRANSFORMER T401	3D
PRINT AMPLIFIERS V5, V6	5A
PRINT DRIVER AMPLIFIER V4A	4A
RB+ CONTROL R126	4D
RC DELAY NETWORK	4B
RC FILTER	1B
RECORD INDICATOR DS3	7B

*The coordinates refer to the numbers along the top and bott



4–1. Recorder Set, Facsimile AN/UXH-2, Overall Block Diagram

the print amplifiers pass the signal on to the recording stylus needles. The control circuits amplify the incoming signal and control tones to control various relay circuits which start, phase and stop the recording mechanism in response to the received signals. The fork oscillator provides a constant frequency source of 3600 cycles which is divided down to provide the correct sync motor frequency.

The Recorder, Facsimile RO76/UXH-2, has a run system to drive the stylus band, a sync system to restrain the band so that the speed of the recording stylus exactly matches the speed of the scanner at the facsimile transmitter, a phasing mechanism to place the recorded copy in the correct position on the recording paper, and a paper feed mechanism driven from the run motor.

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A stop signal, transmitted after the copy facsimile signals, consisting of a 450-cycle square wave signal modulating the carrier for 3 to 5 seconds.

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Figure 4–1 is an overall block diagram showing the course of the signal through the major circuits of the AN/UXH-2 and the functions of the various stages.

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The signal from tube V1A couples through a 1:3 step-up transformer T1 to the grid of tube V2B. The output from V2B is directly coupled to cathode follower V2A which provides a low impedance source for the rectified signal. The output from V2A is fed through a filter network consisting of capacitor C4, rectifier CR1 and resistor R8. DC voltage from this network, which is proportional to signal level, is filtered by capacitor C3 and resistor R7, and applied as a bias to the grids of tube V1A and V1B. The bias will follow the maximum amplitude (black signal), automatically controlling the gain of V1A and V1B to compensate for variations in level of the received signal.

The output from the ALC transformer T2 is fed through ALC OUTPUT control R30 and potentiometer R27A to the grid of print driver stage V4A and thence to interstage transformer T3 and print tubes V5 and V6 connected as push-pull amplifiers. The grids of V5 and V6 are coupled through a resistor network which provides a high impedance input. CONTRAST potentiometer R27B is used to control the bias on the grids of V5 and V6 and is so arranged that the tubes are cut off with no driving signal. The signal must be strong enough to overcome this fixed bias before any print power is obtained. This gives a threshold limiting effect which eliminates the signal transmitted by the background of the original copy. R27A and R27B are ganged together in such a way that when the recorded copy contrast is increased by increasing the bias, the signal level is increased to maintain the same recording density. The ALC OUTPUT control R30 keeps the input to R27 within the necessary limits to permit overall adjustment of the contrast of the recorded copy.

DENSITY control R303 permits variation of the screen voltage of V5 and V6 to control print density.

Resistor R21 applies a small positive voltage to the grids of V5 and V6 to ensure their conducting when first turning the equipment on. When the recorder is standing by, phasing, or before the stylus band starts rotating, there is no plate voltage on V5 and V6 (K102 contacts 10 and 14 are open) and hence no voltage on the trolley bar until record relay K102 is energized, closing contacts 14 and 10. Resistor R231 permits the screen to act as plates and the AC voltage developed across this resistor is used to supply signal to the phasing circuit.

Signal from V5 and V6 is fed through output transformer T5 and 1200-ohm resistor R501 to the trolley bar and stylus needles. Transformer T5 has a 1:1.5 voltage step-up ratio which matches the impedance of the recording paper to the plate circuit of the print amplifiers. Resistor R501 acts as a current limiter. Capacitors C501 and C502 shunt some of the signal at 60 and 90 scans to ensure a relatively constant print density regardless of the recording speed.

INDEX TO PART LOCATIONS ON OVERALL BLOCK DIAGRAM OF RECORDER SET, FACSIMILE AN/UXH-2

ITEM	*LOCATION COORDINATES
ALC AMPLIFIER V1	4A
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ALC FEEDBACK AMPLIFIER V2B	2B
ALC LOCK-OUT SWITCH S306	1A
ALC OUTPUT CONTROL R30	2A
ALC RECTIFIER CR1	2B
AUTO/MAN SWITCH S305	4A
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BIAS SUPPLY	4D
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DENSITY CONTROL R303	5A
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END OF PAPER SWITCH S501	4C
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FORK AMPLIFIER V201	1C
FORK CONTROL R221	1C
FORK FEEDBACK AMPLIFIER V202A	2C
FORK SIGNAL AMPLIFIER V202B	2C
FORK SIGNAL LIMITER CR201	1C
GAIN CONTROL R301	2A
HIGH PASS FILTER FL103	3A
INPUT TRANSFORMER T301	1A
LINE FILTER FL601	1D
LINE FUSES F201, F202	1D
LINE VOLTAGE HIGH/LOW SWITCH S401	3C, 3D
LOCKED OSCILLATOR V203	2C
MOTOR CONTROL R222	3C
PHASE ACTUATOR E501	7A
PHASE ADJUST CONTROL R236	5B
PHASE AMPLIFIER V205A	5A
PHASE DELAY AMPLIFIER DS202	6A
PHASE INDICATOR DS2	6C
PHASE SWITCH S303	4A, 7A
PHASE THYRATRON V204	6A
POWER ON INDICATOR DS201	4C
POWER TRANSFORMER T401	3D
PRINT AMPLIFIERS V5, V6	5A
PRINT DRIVER AMPLIFIER V4A	4A
RB+ CONTROL R126	4D
RC DELAY NETWORK	4B
RC FILTER	1B
RECORD INDICATOR DS3	7B

ITEM	*LOCATION COORDINATES
RECORD RELAY K102	4A, 4B, 5A, 5B, 6C, 7B
RECORD RELAY AMPLIFIER V102A	5B
RECORD TEST BUTTON S102	1B
RESISTOR R114	5B
RESISTORS R211, R216, R217	3C
RUN MOTOR B502	7B
RUN MOTOR ADJUST CONTROLS R130, R131, R132	7B, C
SCANS/MIN SWITCH S302	2C, 3C, 6A, 7B
SELECTOR SWITCH S301	3C, 4C, 6C
SIGNAL AMPLIFIER V4B	2A
SPEAKER LS601	2A
SPEAKER AMPLIFIER V3	2A
SPEAKER VOLUME CONTROL R302	2A
STAND BY INDICATOR DS1	6B
START MOTOR B501B	4C
START RECORD SIGNAL FILTER FL101	3B
START RECORD SIGNAL AMPLIFIER V101B	3B
START RECORD SIGNAL RECTIFIER CR101	3B
START RECORD/STOP RECORD SWITCH S304	5B, 6A
START SIGNAL RECTIFIER CR102	4B
START/STOP RELAY K101	4A, 5B, 6A, 6B
START/STOP RELAY AMPLIFIER V102B	5B
START/STOP SIGNAL AMPLIFIER V101A	4B
START/STOP SIGNAL FILTER FL102	3B
START/STOP TEST OSCILLATOR V103	1B
START TEST BUTTON S103	1B
STEADY TEST BUTTON S104	1B
STOP SIGNAL RECTIFIER CR103	4B
STOP TEST BUTTON S101	2B
SYNC MOTOR B501A	4C
SYNC MOTOR DRIVER AMPLIFIER V205B	3C
SYNC MOTOR POWER AMPLIFIERS V206, V207	4C
TEST SIGNAL RECTIFIERS CR105, CR106	1B
TIMER K1	6B, 7A
UTILITY OUTLET J601	2D
UTILITY OUTLET FUSE F601	2S
VOLTAGE DIFFERENCE AMPLIFIER V104	4D
VOLTAGE REGULATOR TUBES V105, V106	4D

*The coordinates refer to the numbers along the top and bottom and the letters along the sides of figure 4–1.

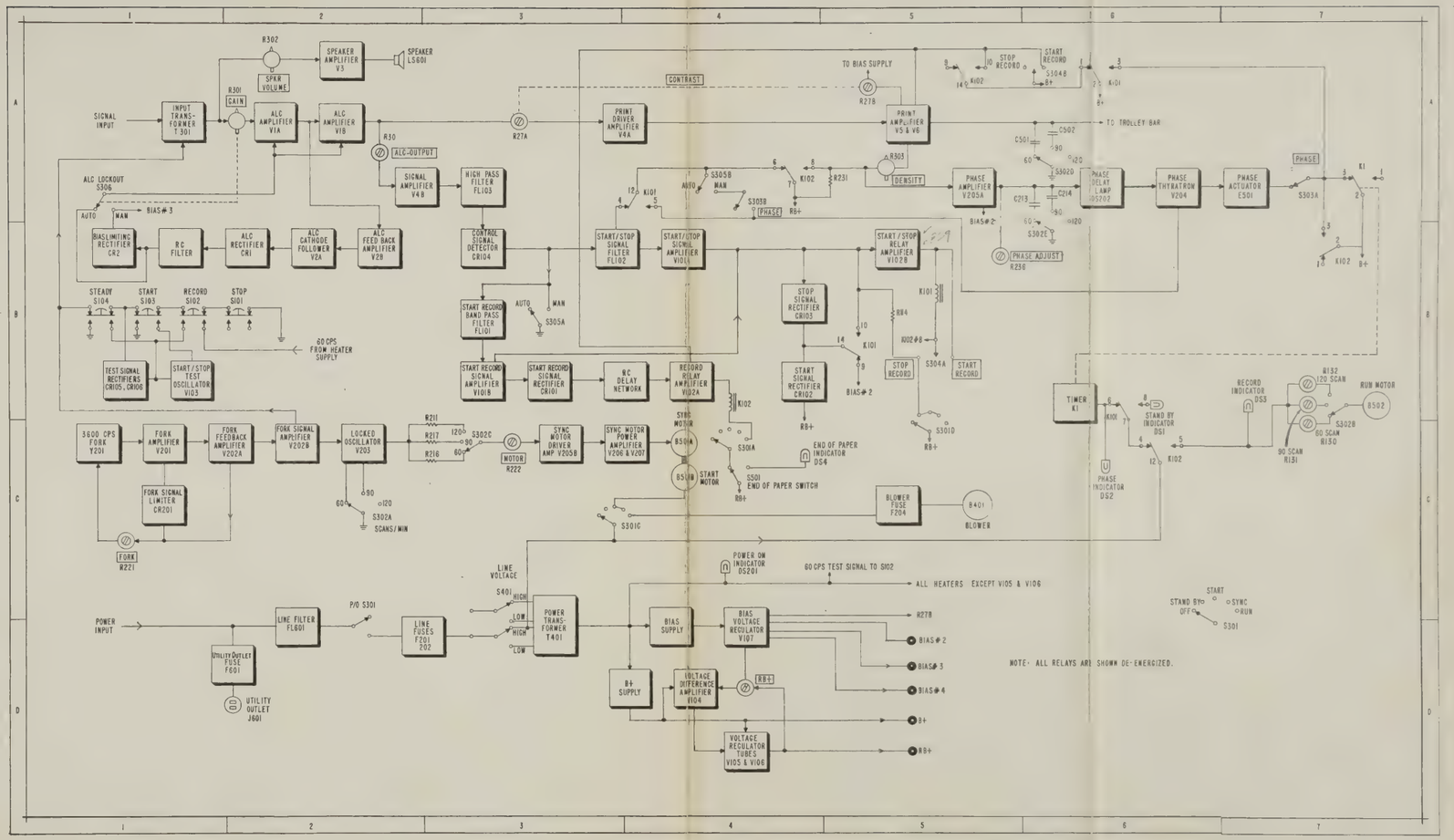
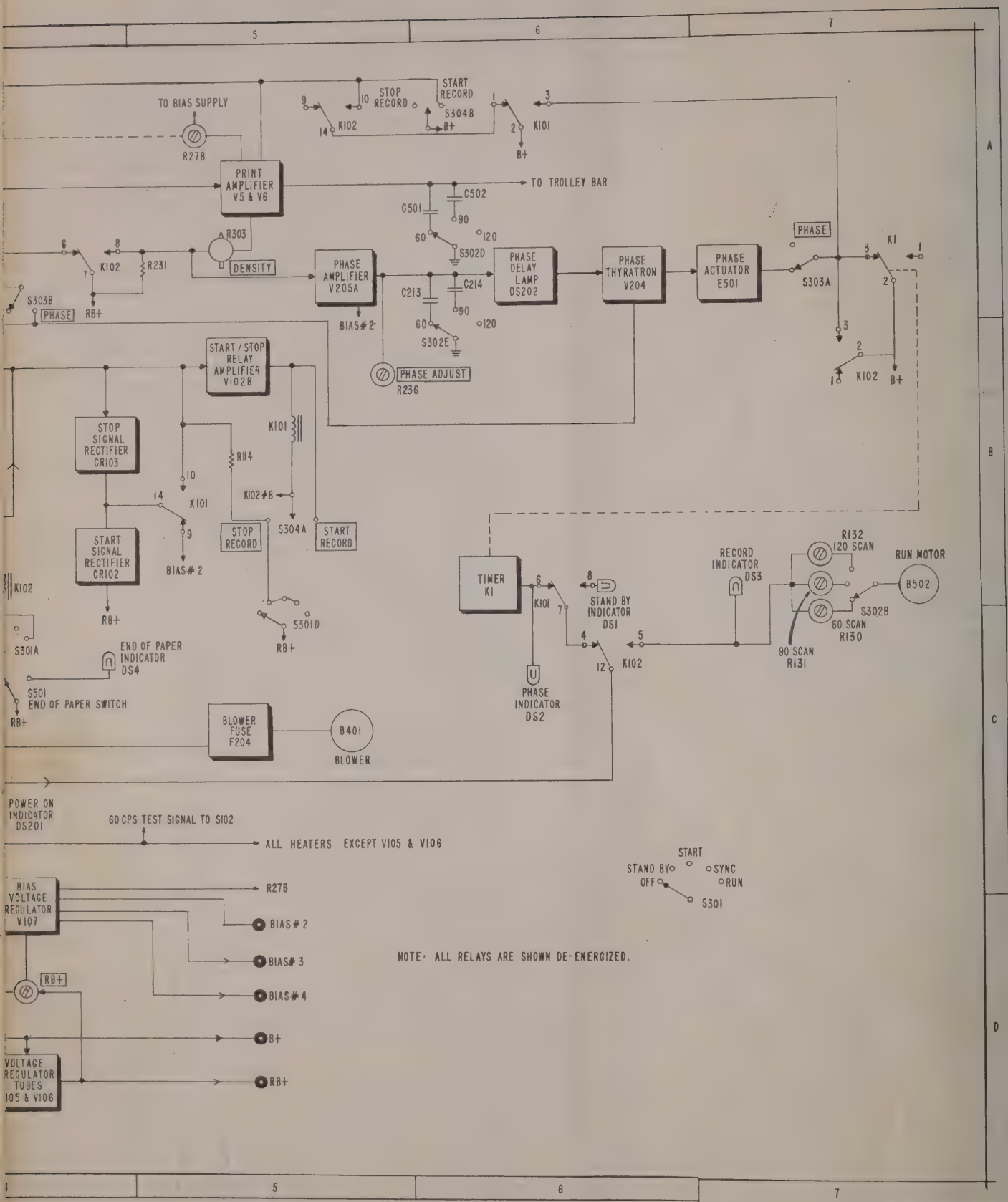


Figure 4–1. Recorder Set, Facsimile AN/UXH-2, Overall Block Diagram


TO BIAS SUPPLY
R27B
PRINT AMPLIFIER V5 & V6
TO TROLLEY BAR
START RECORD
STOP RECORD
S304B
K102
K101
B+
C502
C501
90
60
120
S302D
R303
DENSITY
R231
K102
S303B
PHASE
RB+
PHASE AMPLIFIER V205A
BIAS#2
C213
C214
S302E
PHASE DELAY LAMP DS202
PHASE THYRATRON V204
PHASE ACTUATOR E501
PHASE
S303A
K1
PHASE ADJUST
R236
START / STOP RELAY AMPLIFIER V102B
STOP SIGNAL RECTIFIER CR103
K101
R114
K102#8
START SIGNAL RECTIFIER CR102
BIAS#2
STOP RECORD
S304A
START RECORD
S301D
S301A
END OF PAPER INDICATOR DS4
S501
END OF PAPER SWITCH
BLOWER FUSE F204
B401
BLOWER
TIMER K1
STAND BY INDICATOR DS1
PHASE INDICATOR DS2
RECORD INDICATOR DS3
R132 120 SCAN
RUN MOTOR
B502
S302B
60 SCAN R130
90 SCAN R131
POWER ON INDICATOR DS201
60 CPS TEST SIGNAL TO S102
ALL HEATERS EXCEPT V105 & V106
BIAS VOLTAGE REGULATOR V107
R27B
BIAS#2
BIAS#3
BIAS#4
B+
RB+
VOLTAGE REGULATOR TUBES V105 & V106
START
STAND BY
SYNC
OFF
RUN
S301
NOTE: ALL RELAYS ARE SHOWN DE-ENERGIZED.

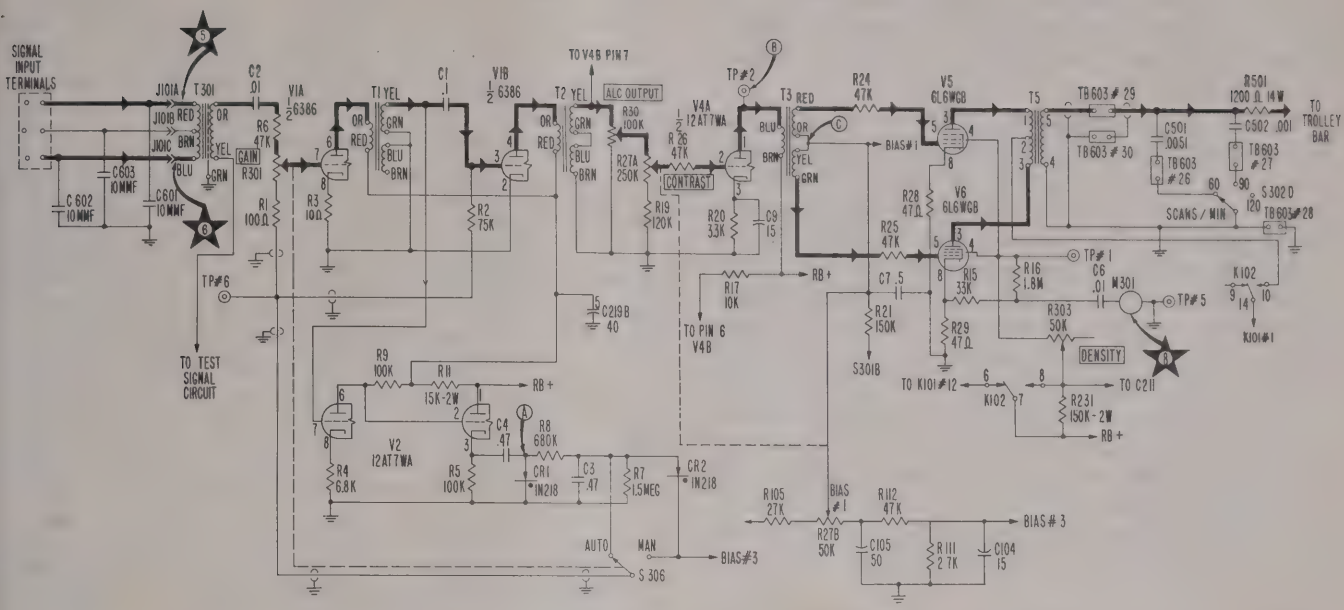


Figure 4–2. Amplifier, Electrical Control AM-1845/UXH-2, Signal Amplifier, ALC and Print Circuits

b. THE AUTOMATIC CONTROL CIRCUITS (figure 4–3). – When selector switch S301 is turned from OFF up to SYNC, start/stop relay K101 is energized by a positive potential applied to the grid of start/stop relay tube V102B to keep the tube conducting and relay K101 energized. This prevents the recording mechanism from starting before S301 is turned to RUN. When S301 is turned to RUN and awaiting a transmission the positive potential is removed from V102B so that it will respond to the transmitted control signals.

With K101 in the energized position, K101 contacts 14 and 10 make, shorting out stop signal rectifier CR103. Signal rectifier CR102 is connected so that its rectification of the incoming signal is a negative bias voltage at contact 14 of K101. K101 contacts 12 and 4 make to tune FL102 to the 300 cps start signal. Contacts 2 and 3 of K101 make to apply holding current through the PHASE switch S303A to the phase actuator E501 to keep the phase magnet armature held back. Contacts 7 and 8 of K101 make to light the STAND BY indicator DS1.

Signal for the control circuits is taken from the secondary of transformer T2, amplified by tube V4B and fed through high pass filter FL103 which prevents random 300 or 450-cycle signals from affecting the control circuits. The output of FL103 feeds the automatic start/stop circuit and the start record circuit.

When the amplitude modulated 300 cycle start signal is received, it is detected by diode CR104, and filtered by FL102, which is tuned to 300 cps. The 300-cycle output of FL102 is amplified by tube V101A and rectified by CR102 to cut off start/stop relay tube V102B and de-energize relay K101. Capacitors C109 and C110A give about 2 seconds delay in the ~~operation of the relay.~~ de-energizing action.

K101 contacts 14 and 9 close, applying a negative voltage to V102B to keep it cut off and the relay released.

K101 contacts 2 and 3 break to release the phase magnet armature (a buzzing sound is heard as the stop arm of the sync clutch is held back by the armature) – see paragraph 4–4*a*.

STAND BY light DS1 extinguishes, and the PHASE light DS2 comes on.

Phasing timer K1 is energized (K101 contact 7 transfers from contact 8 to contact 6).

B+ for holding current in record relay K102 is made available to K102 contact 14 through K101 contacts 1 and 2.

Contacts 12 and 5 of K101 open to tune FL102 to the 450 cps stop signal frequency.

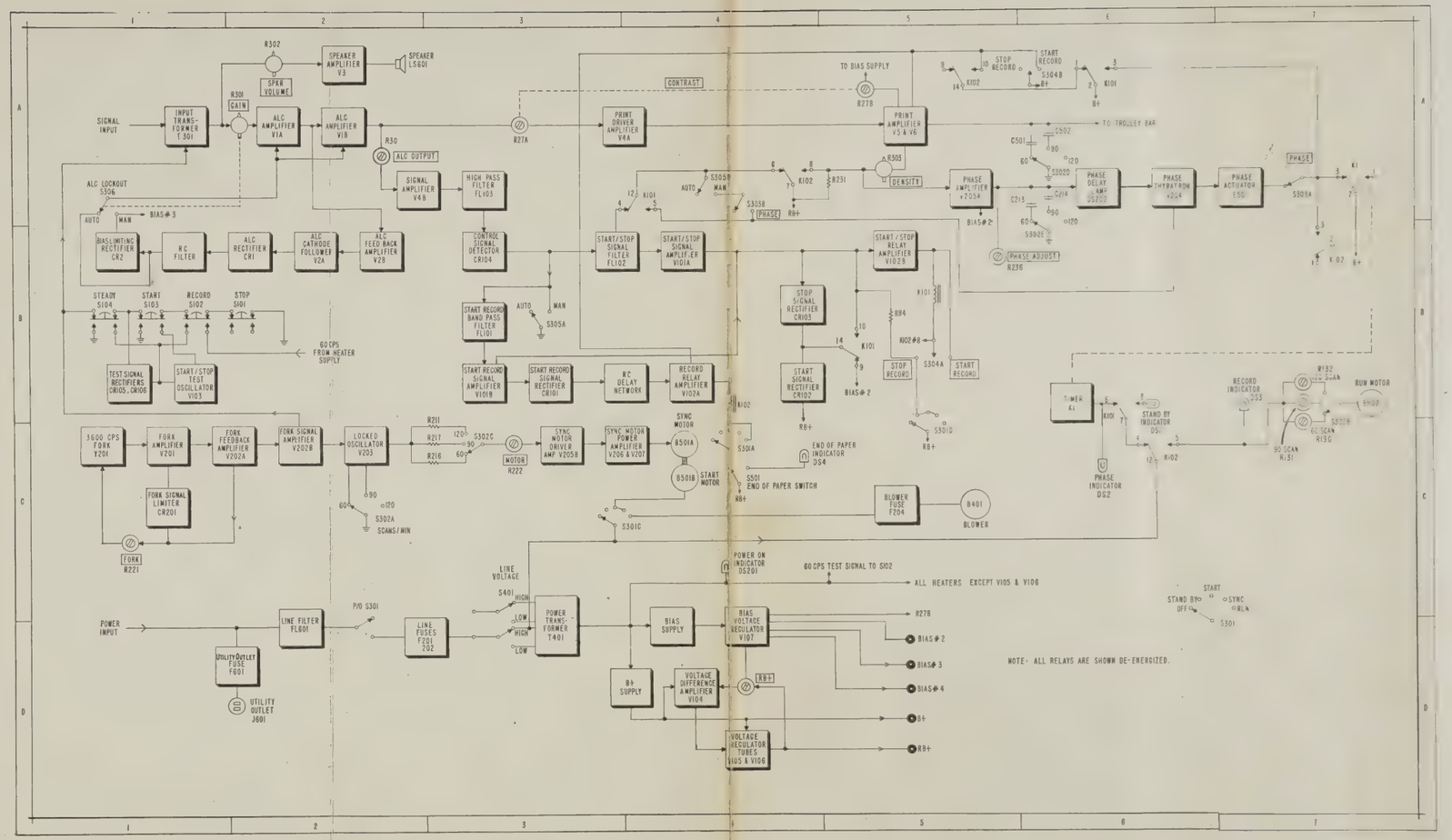
After the start signal, phasing pulses consisting of the carrier, at an amplitude corresponding to the black level of the copy, interrupted once per second by a change to white level, are transmitted for 15 seconds. The phase pulse, filtered by resistor R234 and capacitor C215, brings tube V205A into conduction. The amplified pulse from V205A causes DS202, a neon glow lamp, to conduct; which in turn, fires thyratron V204 and holding current fed to phase actuator E501 pulls back the armature. Capacitors C213 and C214, connected to the 60 and 90 scans/min. positions of switch S302E respectively, provide delay so that there is no shift in copy position when the scan rate is changed.

INDEX TO PART LOCATIONS ON OVERALL BLOCK DIAGRAM OF RECORDER SET, FACSIMILE AN/UXH-2

ITEM	*LOCATION COORDINATES
ALC AMPLIFIER V1	4A
ALC CATHODE FOLLOWER V2A	2B
ALC FEEDBACK AMPLIFIER V2B	2B
ALC LOCK-OUT SWITCH S306	1A
ALC OUTPUT CONTROL R30	2A
ALC RECTIFIER CR1	2B
AUTO MAN SWITCH S305	4A
B+ SUPPLY	4D
BIAS LIMITING RECTIFIER CR2	1B
BIAS SUPPLY	4D
BIAS VOLTAGE REGULATOR V107	4D
BLOWER B401	5C
BLOWER FUSE F204	5C
CAPACITORS C213, C214	6A
CAPACITORS C501, C502	6A
CONTRAST CONTROL R27	3A, 5A
DENSITY CONTROL R303	5A
END OF PAPER INDICATOR DS4	4C
END OF PAPER SWITCH S501	4C
FORK, 3600 CPS, Y201	1C
FORK AMPLIFIER V201	1C
FORK CONTROL R221	1C
FORK FEEDBACK AMPLIFIER V202A	2C
FORK SIGNAL AMPLIFIER V202B	2C
FORK SIGNAL LIMITER CR201	1C
GAIN CONTROL R301	2A
HIGH PASS FILTER FL103	3A
INPUT TRANSFORMER T301	1A
LINE FILTER FL601	1D
LINE FUSES F201, F202	1D
LINE VOLTAGE HIGH/LOW SWITCH S401	3C, 3D
LOCKED OSCILLATOR V203	2C
MOTOR CONTROL R222	3C
PHASE ACTUATOR E501	7A
PHASE ADJUST CONTROL R236	5B
PHASE AMPLIFIER V205A	5A
PHASE DELAY AMPLIFIER DS202	6A
PHASE INDICATOR DS2	6C
PHASE SWITCH S303	4A, 7A
PHASE THYRATRON V204	6A
POWER ON INDICATOR DS201	4C
POWER TRANSFORMER T401	3D
PRINT AMPLIFIERS V5, V6	5A
PRINT DRIVER AMPLIFIER V4A	4A
RB+ CONTROL R126	4D
RC DELAY NETWORK	4B
RC FILTER	1B
RECORD INDICATOR DS3	7B

ITEM	*LOCATION COORDINATES
RECORD RELAY K102	4A, 4B, 5A, 5B, 6C, 7B
RECORD RELAY AMPLIFIER V102A	5B
RECORD TEST BUTTON S102	1B
RESISTOR R114	5B
RESISTORS R211, R216, R217	3C
RUN MOTOR B502	7B
RUN MOTOR ADJUST CONTROLS R130, R131, R132	7B, C
SCANS/MIN SWITCH S302	2C, 3C, 6A, 7B
SELECTOR SWITCH S301	3C, 4C, 6C
SIGNAL AMPLIFIER V4B	2A
SPEAKER LS601	2A
SPEAKER AMPLIFIER V3	2A
SPEAKER VOLUME CONTROL R302	2A
STAND BY INDICATOR DS1	6B
START MOTOR B501B	4C
START RECORD SIGNAL FILTER FL101	3B
START RECORD SIGNAL AMPLIFIER V101B	3B
START RECORD SIGNAL RECTIFIER CR101	3B
START RECORD/STOP RECORD SWITCH S304	5B, 6A
START SIGNAL RECTIFIER CR102	4B
START/STOP RELAY K101	4A, 5B, 6A, 6B
START/STOP RELAY AMPLIFIER V102B	5B
START/STOP SIGNAL AMPLIFIER V101A	4B
START/STOP SIGNAL FILTER FL102	3B
START/STOP TEST OSCILLATOR V103	1B
START TEST BUTTON S103	1B
STEADY TEST BUTTON S104	1B
STOP SIGNAL RECTIFIER CR103	4B
STOP TEST BUTTON S101	2B
SYNC MOTOR B501A	4C
SYNC MOTOR DRIVER AMPLIFIER V205B	3C
SYNC MOTOR POWER AMPLIFIERS V206, V207	4C
TEST SIGNAL RECTIFIERS CR105, CR106	1B
TIMER K1	6B, 7A
UTILITY OUTLET J601	2D
UTILITY OUTLET FUSE F601	2S
VOLTAGE DIFFERENCE AMPLIFIER V104	4D
VOLTAGE REGULATOR TUBES V105, V106	4D

*The coordinates refer to the numbers along the top and bottom and the letters along the sides of figure 4–1.



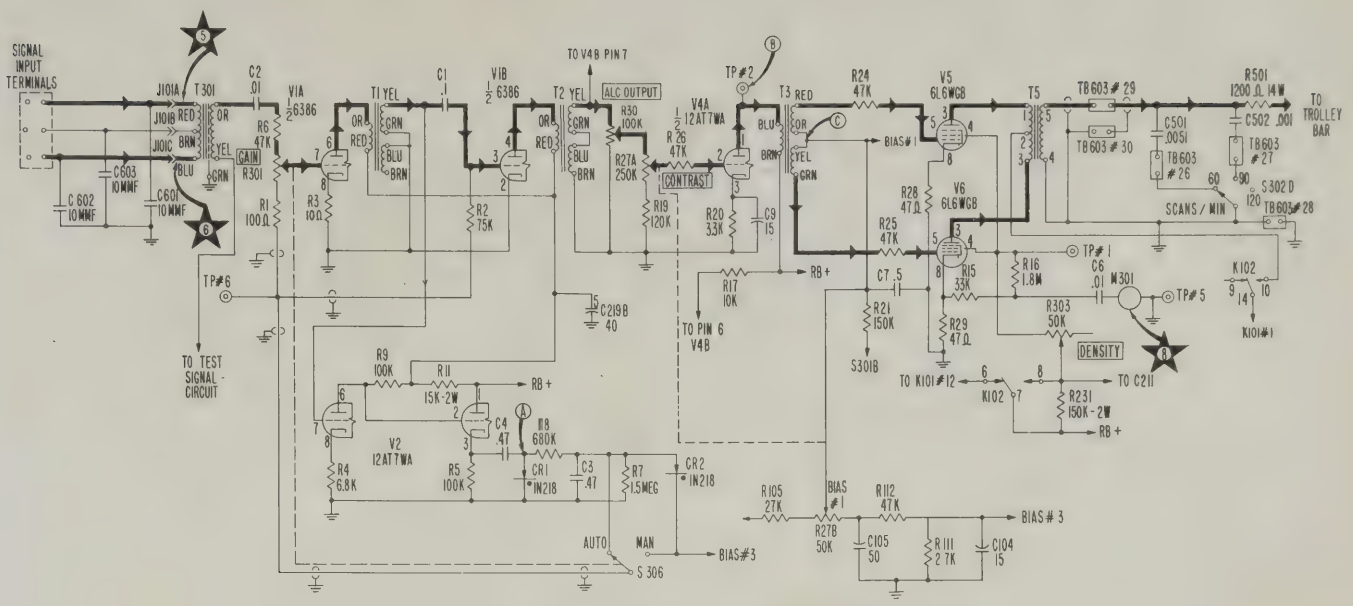


Figure 4–2. Amplifier, Electrical Control AM-1845/UXH-2, Signal Amplifier, ALC and Print Circuits

b. THE AUTOMATIC CONTROL CIRCUITS (figure 4–3). – When selector switch S301 is turned from OFF up to SYNC, start/stop relay K101 is energized by a positive potential applied to the grid of start/stop relay tube V102B to keep the tube conducting and relay K101 energized. This prevents the recording mechanism from starting before S301 is turned to RUN. When S301 is turned to RUN and awaiting a transmission the positive potential is removed from V102B so that it will respond to the transmitted control signals.

With K101 in the energized position, K101 contacts 14 and 10 make, shorting out stop signal rectifier CR103. Signal rectifier CR102 is connected so that its rectification of the incoming signal is a negative bias voltage at contact 14 of K101. K101 contacts 12 and 4 make to tune FL102 to the 300 cps start signal. Contacts 2 and 3 of K101 make to apply holding current through the PHASE switch S303A to the phase actuator E501 to keep the phase magnet armature held back. Contacts 7 and 8 of K101 make to light the STAND BY indicator DS1.

Signal for the control circuits is taken from the secondary of transformer T2, amplified by tube V4B and fed through high pass filter FL103 which prevents random 300 or 450-cycle signals from affecting the control circuits. The output of FL103 feeds the automatic start/stop circuit and the start record circuit.

When the amplitude modulated 300 cycle start signal is received, it is detected by diode CR104, and filtered by FL102, which is tuned to 300 cps. The 300-cycle output of FL102 is amplified by tube V101A and rectified by CR102 to cut off start/stop relay tube V102B and de-energize relay K101. Capacitors C109 and C110 give about 2 seconds delay in the ~~operation of the relay.~~ de-energizing action.

K101 contacts 14 and 9 close, applying a negative voltage to V102B to keep it cut off and the relay released.

K101 contacts 2 and 3 break to release the phase magnet armature (a buzzing sound is heard as the stop arm of the sync clutch is held back by the armature) — see paragraph 4–4*a*.

STAND BY light DS1 extinguishes, and the PHASE light DS2 comes on.

Phasing timer K1 is energized (K101 contact 7 transfers from contact 8 to contact 6).

B+ for holding current in record relay K102 is made available to K102 contact 14 through K101 contacts 1 and 2.

Contacts 12 and 5 of K101 open to tune FL102 to the 450 cps stop signal frequency.

After the start signal, phasing pulses consisting of the carrier, at an amplitude corresponding to the black level of the copy, interrupted once per second by a change to white level, are transmitted for 15 seconds. The phase pulse, filtered by resistor R234 and capacitor C215, brings tube V205A into conduction. The amplified pulse from V205A causes DS202, a neon glow lamp, to conduct; which in turn, fires thyratron V204 and holding current fed to phase actuator E501 pulls back the armature. Capacitors C213 and C214, connected to the 60 and 90 scans/min. positions of switch S302E respectively, provide delay so that there is no shift in copy position when the scan rate is changed.

Timer K1 contacts 1 and 2 are open for seven seconds, during which time phasing is accomplished. When K1 closes, holding current is applied to phase actuator E501 through K1 contacts 1 and 2 to keep the phase magnet armature pulled back.

When the start record signal, the carrier signal amplitude-modulated by a 60-cps tone, is received, it is filtered by high pass filter FL101. The output from FL101 is amplified by tube V101B and rectified by CR101 so as to bias the grid of record relay tube V102A positively, increasing the conductivity to operate record relay K102. Contacts 12 and 5 of K102 make to light the RECORD indicator DS3, to apply power to the run motor to start the stylus band rotating. Timer K1 is released (K102 contacts 12 and 4 break) and holding current is applied to the phase actuator through K102 contacts 2 and 3. Contacts 7 and 8 of K102 make to short out R231 which increases the screen voltage to the print amplifiers V5 and V6. Plate voltage is applied to V5 and V6 through K102 contacts 14 and 10 and print power from these tubes is fed through the output transformer T5 to the stylus needles.

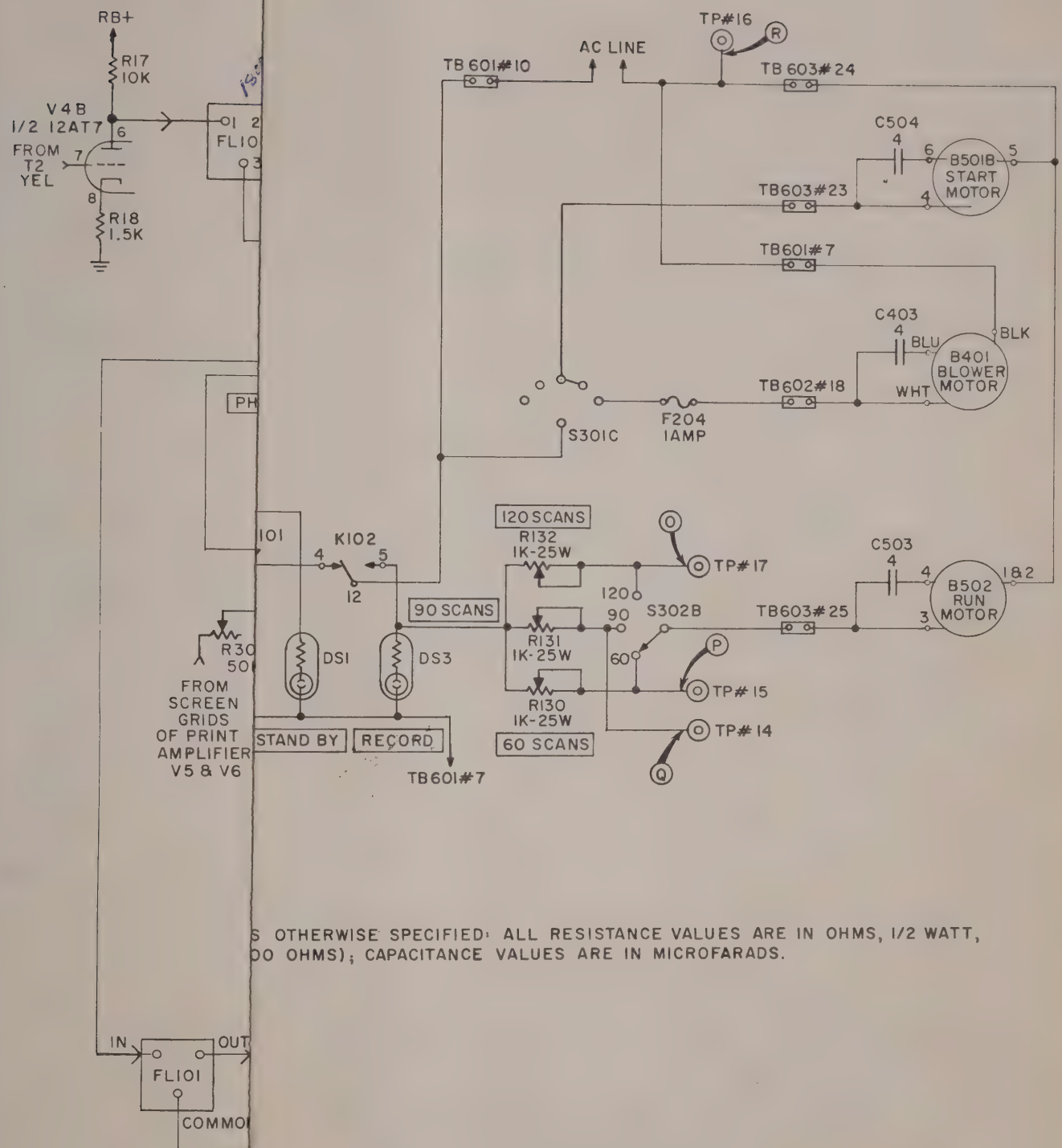
At the end of the transmision, the stop tone, a 450-cycle amplitude-modulated carrier signal is received. This is detected by CR104 and fed to FL102 (now tuned to 450 cps by open contacts 12 and 5 of K101). From FL102, the signal is amplified by tube V101A and rectified by CR103. Signal from CR103 overcomes the negative bias on stop/start relay tube V102B, causing it to conduct and energize stop/start relay K101.

K101 contacts 14 and 10 make to apply a positive potential to V102B to keep it conducting. Contacts 12 and 5 of K101 make to tune FL102 to the 350 cps start signal frequency. K101 contacts 2 and 3 make to keep holding current on the phase actuator. K101 contacts 2 and 1 open to release record relay K102. Contacts 14 and 10 of K102 break, removing plate voltage from V5 and V6. K102 contacts 6 and 7 make, inserting R231 in the screen circuit of V5 and V6. K102 contacts 12 and 5 open, removing power from the run motor to stop the stylus band. The recorder is now ready for the next transmission.

Table 4–1 outlines the condition of the relays and phase actuator during the various phases of automatic operation.

TABLE 4–1. CONDITION OF RELAYS AND PHASE ACTUATOR DURING AUTOMATIC OPERATION.

OPERATING CONDITION	START/STOP RELAY K101	PHASE ACTUATOR E501	TIMER K1	RECORD RELAY K102
Stand by.	Energized. Pos. potential on V102B keeps it conducting & K101 locked by contacts 14 & 10.	Energized. Through K101 contacts 2 and 3 and switch S303.	Released.	Released.
Start signal received.	Released. V102B cuts off by signal rectified by CR102.	Released. K101 contacts 2 and 3 open.	Energized. K101 contacts 7 & 6 make.	Released. But B+ made available through K101 contacts 1 & 2.
Phasing signal received.	Released. Negative bias voltage applied to V102B by contact 14 and 9 of K101.	Released. But responds to phasing pulses through thyratron V204 until timer K1 closes to apply holding current through its contacts 1 & 2.	Energized.	Released.
Start record signal received.	Released.	Energized. Through K102 contacts 2 & 3.	Released. K102 contacts 4 & 12 open.	Energized. V102A conducts on signal detected by CR101.
Facsimile signals received.	Released.	Energized.	Released.	Energized.
Stop record signal.	Energized. Signal from CR103 overcomes negative bias on V102B to make it conduct.	Energized. Through K101 contacts 2 and 3.	Released.	Released. K101 contacts 2 and 1 open.



S OTHERWISE SPECIFIED: ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT,
OO OHMS); CAPACITANCE VALUES ARE IN MICROFARADS.

Figure 4–3. Amplifier, Electrical Control AM-1845/UXH-2, Automatic Control Circuits

Timer K1 contacts 1 and 2 are open for seven seconds, during which time phasing is accomplished. When K1 closes, holding current is applied to phase actuator E501 through K1 contacts 1 and 2 to keep the phase magnet armature pulled back.

When the start record signal, the carrier signal amplitude-modulated by a 60-cps tone, is received, it is filtered by high pass filter FL101. The output from FL101 is amplified by tube V101B and rectified by CR101 so as to bias the grid of record relay tube V102A positively, increasing the conductivity to operate record relay K102. Contacts 12 and 5 of K102 make to light the RECORD indicator DS3, to apply power to the run motor to start the stylus band rotating. Timer K1 is released (K102 contacts 12 and 4 break) and holding current is applied to the phase actuator through K102 contacts 2 and 3. Contacts 7 and 8 of K102 make to short out R231 which increases the screen voltage to the print amplifiers V5 and V6. Plate voltage is applied to V5 and V6 through K102 contacts 14 and 10 and print power from these tubes is fed through the output transformer T5 to the stylus needles.

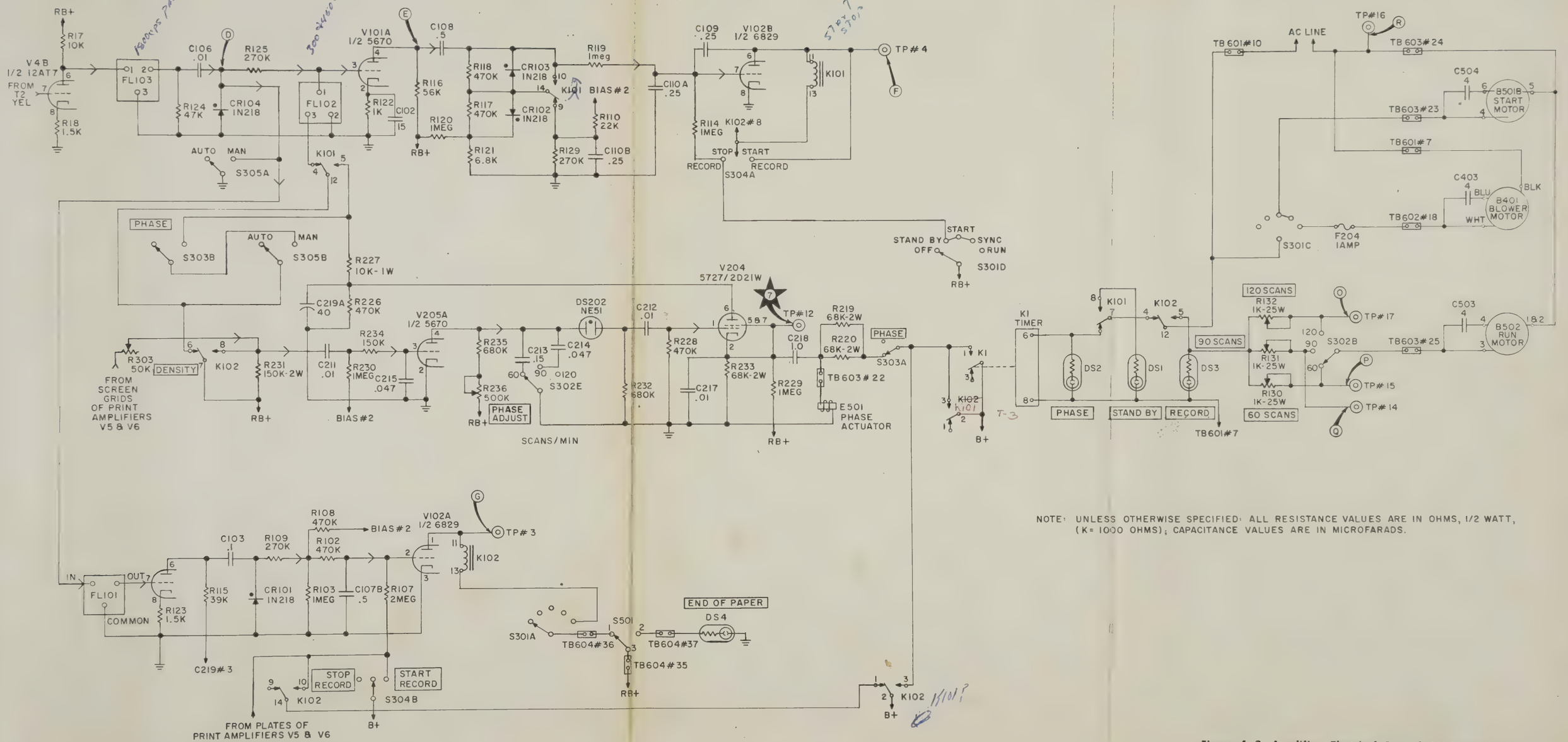
At the end of the transmision, the stop tone, a 450-cycle amplitude-modulated carrier signal is received. This is detected by CR104 and fed to FL102 (now tuned to 450 cps by open contacts 12 and 5 of K101). From FL102, the signal is amplified by tube V101A and rectified by CR103. Signal from CR103 overcomes the negative bias on stop/start relay tube V102B, causing it to conduct and energize stop/start relay K101.

K101 contacts 14 and 10 make to apply a positive potential to V102B to keep it conducting. Contacts 12 and 5 of K101 make to tune FL102 to the 350 cps start signal frequency. K101 contacts 2 and 3 make to keep holding current on the phase actuator. K101 contacts 2 and 1 open to release record relay K102. Contacts 14 and 10 of K102 break, removing plate voltage from V5 and V6. K102 contacts 6 and 7 make, inserting R231 in the screen circuit of V5 and V6. K102 contacts 12 and 5 open, removing power from the run motor to stop the stylus band. The recorder is now ready for the next transmission.

Table 4–1 outlines the condition of the relays and phase actuator during the various phases of automatic operation.

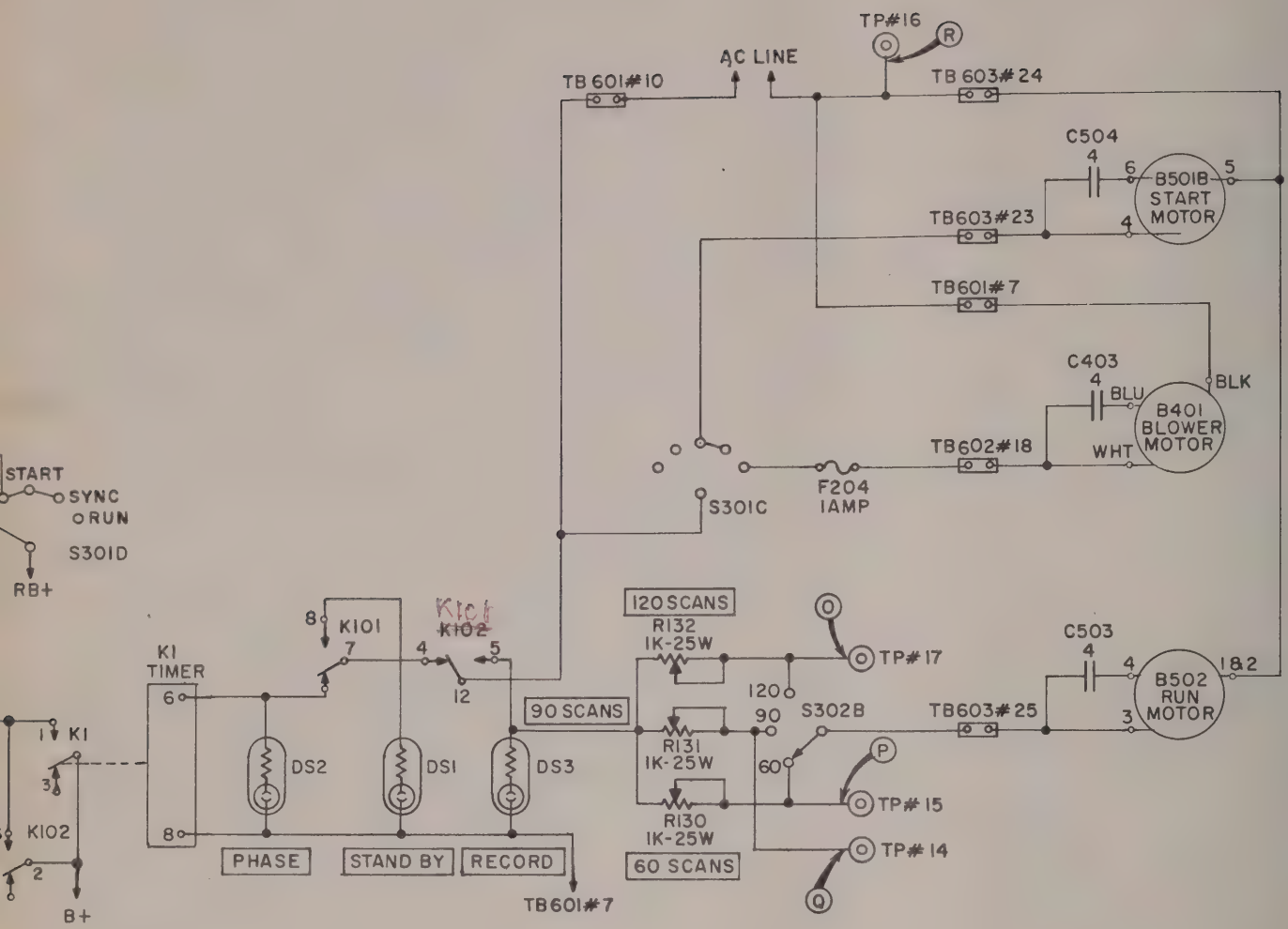
TABLE 4–1. CONDITION OF RELAYS AND PHASE ACTUATOR DURING AUTOMATIC OPERATION.

OPERATING CONDITION	START/STOP RELAY K101	PHASE ACTUATOR E501	TIMER K1	RECORD RELAY K102
Stand by.	Energized. Pos. potential on V102B keeps it conducting & K101 locked by contacts 14 & 10.	Energized. Through K101 contacts 2 and 3 and switch S303.	Released.	Released.
Start signal received.	Released. V102B cuts off by signal rectified by CR102.	Released. K101 contacts 2 and 3 open.	Energized. K101 contacts 7 & 6 make.	Released. But B+ made available through K101 contacts 1 & 2.
Phasing signal received.	Released. Negative bias voltage applied to V102B by contact 14 and 9 of K101.	Released. But responds to phasing pulses through thyratron V204 until timer K1 closes to apply holding current through its contacts 1 & 2.	Energized.	Released.
Start record signal received.	Released.	Energized. Through K102 contacts 2 & 3.	Released. K102 contacts 4 & 12 open.	Energized. V102A conducts on signal detected by CR101.
Facsimile signals received.	Released.	Energized.	Released.	Energized.
Stop record signal.	Energized. Signal from CR103 overcomes negative bias on V102B to make it conduct.	Energized. Through K101 contacts 2 and 3.	Released.	Released. K101 contacts 2 and 1 open.



NOTE: UNLESS OTHERWISE SPECIFIED: ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT, (K = 1000 OHMS); CAPACITANCE VALUES ARE IN MICROFARADS.

Figure 4-3. Amplifier, Electrical Control AM-1845/UXH-2, Automatic Control Circuits



NOTE: UNLESS OTHERWISE SPECIFIED: ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT, (K= 1000 OHMS); CAPACITANCE VALUES ARE IN MICROFARADS.

c. MANUAL OPERATION (figure 4–3) – If the equipment is operated manually (AUTO/MAN switch S305 in MAN position), section S305A shorts the input to the start/stop signal filter FL102 and the start record signal filter FL101 to ground so they cannot respond to the transmitted control signals.

When the equipment is turned on, a positive potential is applied to start/stop relay tube V102B to keep it conducting to operate start/stop relay K101. The STAND BY indicator DS1 is lighted through K101 contacts 7 and 8. Holding current is applied to the phase actuator E501 through K101 contacts 2 and 3 and PHASE switch S303A.

When phasing signal appears on the line, the operator activates S303. Section S303A removes holding current from the phase actuator. Section S303B applies plate voltage to thyratron V204 and phasing pulses fire this tube as explained above. After three phasing pulses, the operator releases S303 to reapply holding current to actuator E501.

When copy signals start, the operator activates switch S304 momentarily to START RECORD, which causes record relay tube V102A to conduct and operate relay K102. K102 contacts 10 and 14 make to keep K102 energized. Screen and plate voltage is restored to print amplifiers V5 and V6, (contacts 7 and 8 of K102 make to short out resistor R231. K102 contacts 12 and 5 make to apply power to run motor. The band starts turning and the equipment records the received signals.

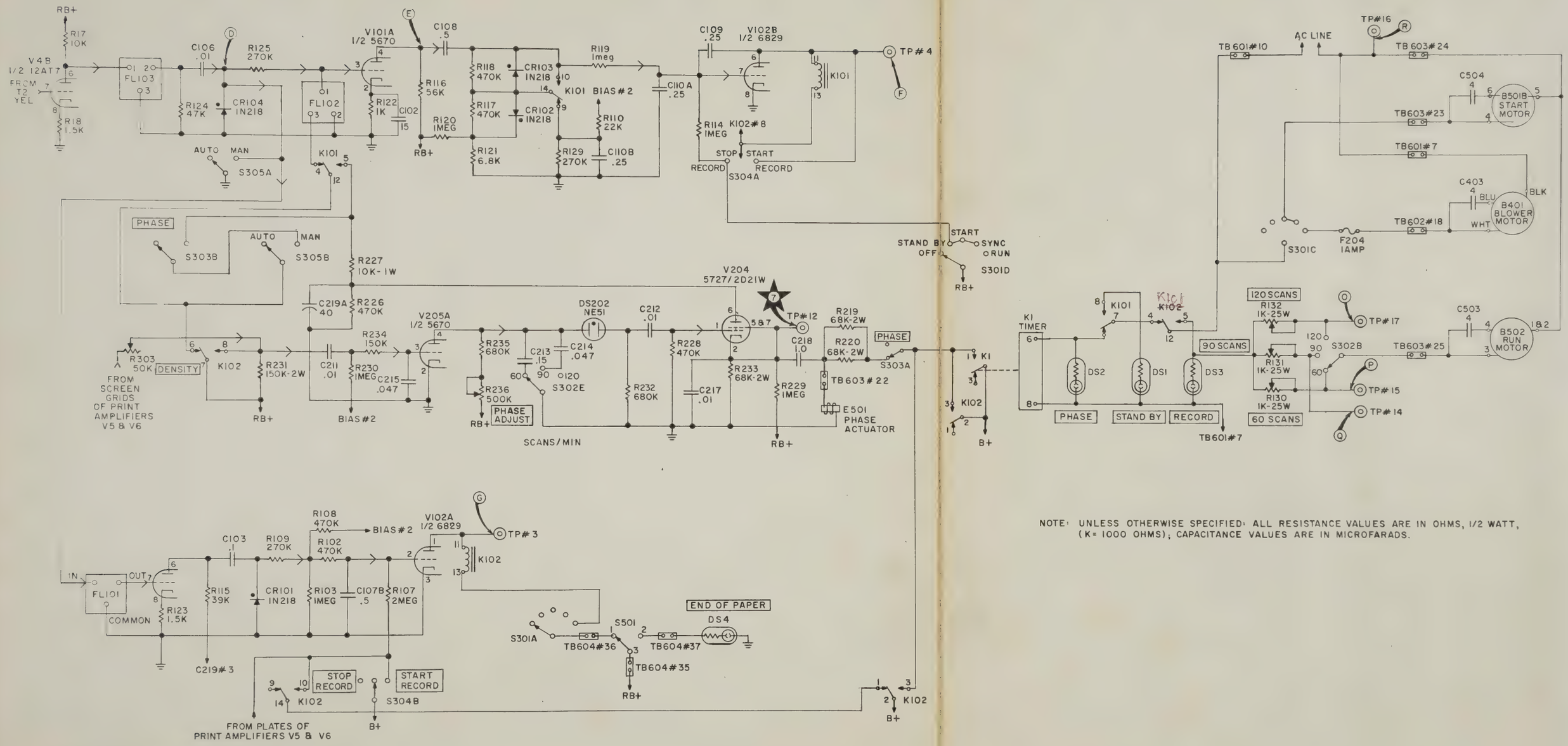
When the transmission is ended, the operator activates S304 momentarily to STOP RECORD, which causes start/stop relay tube V102B to conduct and operate relay K101. As in automatic operation, K101 contacts 2 and 3 make to apply holding current to the phase actuator, and K101 contacts 2 and 1 open to release record relay K102 which removes print power from the stylus needles and stops the run ~~and blower~~ motors.

Table 4–2 outlines the condition of the relays and phase actuator during the various phases of manual operation.

d. END-OF-PAPER STOP SWITCH, S501. – The end-of-paper stop switch is mounted on the left rear side of the mechanical unit and is activated by a pin on the left paper roll support assembly. During normal operation, and when the supply of paper is sufficient, this pin is pulled around clockwise until it hits a limiting stop pin. It remains in this position as long as the paper is under tension. When the supply of paper is exhausted, the tension is removed and the pin returns in a counterclockwise direction and activates the switch. This switch removes the RB+ voltage from relay K102 and stops the recording mechanism. It also activates an END-OF-PAPER light DS4 mounted on the front right side of the cabinet.

TABLE 4–2. CONDITION OF RELAYS AND PHASE ACTUATOR DURING MANUAL OPERATION.

OPERATING CONDITION	START/STOP RELAY K101	PHASE ACTUATOR E501	RECORD RELAY K102	TIMER K1
Stand by.	Energized. Pos. potential on V102B keeps it conducting.	Energized. Through K101 contacts 2 and3 and switch S303.	Released.	Released.
Phasing.	Energized. Pos. potential on V102B keeps it conducting.	Released. (S303A open). Responds to phasing pulses through thyratron V204 until PHASE switch released.	Released.	Released.
Recording.	Released.	Energized. Through K102 contacts 2 and 3 and switch S303.	Energized. START RECORD switch S304 makes V102A conduct. Contacts 10 and 14 maintain holding current.	Released.
End of transmission.	Energized. STOP RECORD switch S304 makes V102B conduct.	Energized. Through K102. contacts 2 and 3 and switch S303.	Released. K101 contacts 2 and 1 open.	Released.



NOTE: UNLESS OTHERWISE SPECIFIED: ALL RESISTANCE VALUES ARE IN OHMS, 1/2 WATT, (K = 1000 OHMS); CAPACITANCE VALUES ARE IN MICROFARADS.

Figure 4–3. Amplifier, Electrical Control AM-1845/UXH-2, Automatic Control Circuits

c. MANUAL OPERATION (figure 4–3) – If the equipment is operated manually (AUTO/MAN switch S305 in MAN position), section S305A shorts the input to the start/stop signal filter FL102 and the start record signal filter FL101 to ground so they cannot respond to the transmitted control signals.

When the equipment is turned on, a positive potential is applied to start/stop relay tube V102B to keep it conducting to operate start/stop relay K101. The STAND BY indicator DS1 is lighted through K101 contacts 7 and 8. Holding current is applied to the phase actuator E501 through K101 contacts 2 and 3 and PHASE switch S303A.

When phasing signal appears on the line, the operator activates S303. Section S303A removes holding current from the phase actuator. Section S303B applies plate voltage to thyratron V204 and phasing pulses fire this tube as explained above. After three phasing pulses, the operator releases S303 to reapply holding current to actuator E501.

When copy signals start, the operator activates switch S304 momentarily to START RECORD, which causes record relay tube V102A to conduct and operate relay K102. K102 contacts 10 and 14 make to keep K102 energized. Screen and plate voltage is restored to print amplifiers V5 and V6, (contacts 7 and 8 of K102 make to short out resistor R231. K102 contacts 12 and 5 make to apply power to run motor. The band starts turning and the equipment records the received signals.

When the transmission is ended, the operator activates S304 momentarily to STOP RECORD, which causes start/stop relay tube V102B to conduct and operate relay K101. As in automatic operation, K101 contacts 2 and 3 make to apply holding current to the phase actuator, and K101 contacts 2 and 1 open to release record relay K102 which removes print power from the stylus needles and stops the run ~~and blower~~ motors.

Table 4–2 outlines the condition of the relays and phase actuator during the various phases of manual operation.

d. END-OF-PAPER STOP SWITCH, S501. – The end-of-paper stop switch is mounted on the left rear side of the mechanical unit and is activated by a pin on the left paper roll support assembly. During normal operation, and when the supply of paper is sufficient, this pin is pulled around clockwise until it hits a limiting stop pin. It remains in this position as long as the paper is under tension. When the supply of paper is exhausted, the tension is removed and the pin returns in a counterclockwise direction and activates the switch. This switch removes the RB+ voltage from relay K102 and stops the recording mechanism. It also activates an END-OF-PAPER light DS4 mounted on the front right side of the cabinet.

TABLE 4–2. CONDITION OF RELAYS AND PHASE ACTUATOR DURING MANUAL OPERATION.

OPERATING CONDITION	START/STOP RELAY K101	PHASE ACTUATOR E501	RECORD RELAY K102	TIMER K1
Stand by.	Energized. Pos. potential on V102B keeps it conducting.	Energized. Through K101 contacts 2 and3 and switch S303.	Released.	Released.
Phasing.	Energized. Pos. potential on V102B keeps it conducting.	Released. (S303A open). Responds to phasing pulses through thyratron V204 until PHASE switch released.	Released.	Released.
Recording.	Released.	Energized. Through K102 contacts 2 and 3 and switch S303.	Energized. START RECORD switch S304 makes V102A conduct. Contacts 10 and 14 maintain holding current.	Released.
End of transmission.	Energized. STOP RECORD switch S304 makes V102B conduct.,	Energized. Through K102. contacts 2 and 3 and switch S303.	Released. K101 contacts 2 and 1 open.	Released.

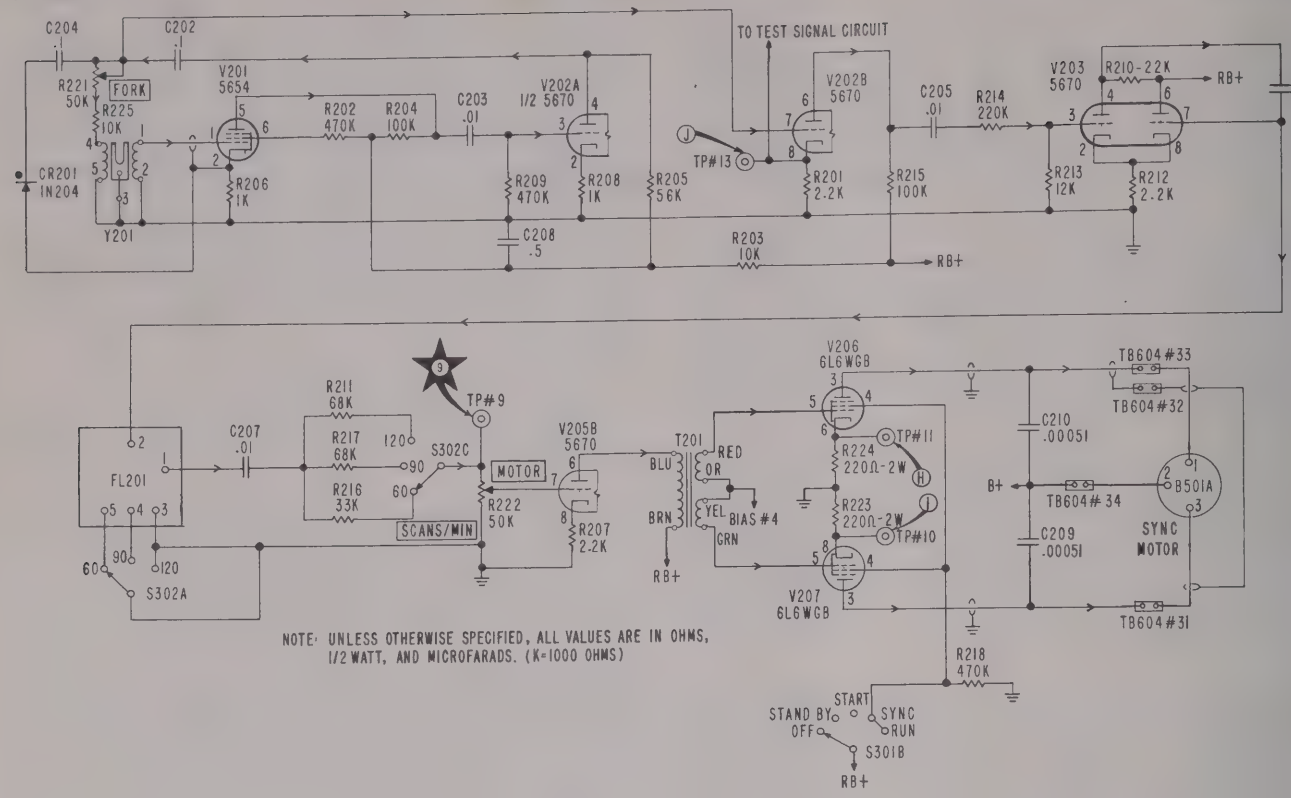


Figure 4–4. Amplifier, Electrical Control AM-1845/UXH-2, Fork Amplifier and Synchronous Motor Drive Circuits

e. FORK OSCILLATOR AND SYNC MOTOR DRIVE CIRCUITS (figure 4–4). – The fork oscillator circuit is a frequency standard which provides the correct frequency for the sync motor to keep the recorder accurately synchronized with the remote transmitter. The fork oscillator circuit used in the AN/UXH-2 recorder is an extremely stable frequency source, independent of any normal variations of plate supply and heater voltages.

The 3600 cycle signal from the fork pick-up coil is amplified by V201 and V202A. The output of V202A is fed back through capacitor C202 and the FORK DRIVE control R221 to the drive coil. Shunted across the drive coil and potentiometer is a diode limiter CR201 whose function is to maintain a constant voltage to this point. This is used to eliminate any changes in drive due to tube aging or voltage variation. The FORK DRIVE control R221 is factory set and during normal operation and use will not require field adjustment. Part of the signal developed across the fork control is fed into an isolation amplifier V202B. The output of V202B is used to feed a locked oscillator V203. This oscillator is locked at either 1200, 900, or 600 cycles per second depending upon the stroke speed (scans per minute) to be recorded.

The second stage of V203 is tuned by LC network FL201 in the grid circuit of the tube. The frequency of FL201 is determined by the setting of the SCANS/MIN switch S302. V203 will oscillate at 1200 cps for 120 scans/minute operation, 900 cps for 90 scans/minute, and at 600 cps for 60 scans/minute operation.

The output from V203 is fed through resistor R211, R216, or R217 (depending on the setting of S302), and MOTOR drive potentiometer R222 to give the proper drive voltage to the motor drive tube V205B. The change of resistors is necessary because the reactance of the motor changes at different frequencies.

V205B is a transformer-coupled amplifier which drives the motor power amplifier tubes V206 and V207 through T201, a 3:1 step-down interstage transformer.

The sync motor is connected in series with the plate supply to tubes V206 and V207 so that DC from these tubes feeds through the motor coils. Since there is no reversal of current through the coils, there is only one pulse of magnetic pull per cycle. The rotor of this motor has no winding and looks like a 60-tooth gear. Each magnetic pulse advances the rotor one tooth. The stator coils for phase 1 and phase 2 are so located that when the rotor teeth match up with phase 1 stator teeth, the stator teeth of phase 2 are half-way between the rotor teeth. Since phase 2 gets magnetic pulses which are 180° out of phase with phase 1, the rotor gets two magnetic pulses per cycle of current, but the rotor advance per cycle is only one tooth.

It should be noted at this point that the speed of the synchronous motor is directly related to the input signal, for instance for a 600 cycle input signal the motor would be turning at 600 rpm. etc. The scans per minute is one-tenth of the sync motor speed.

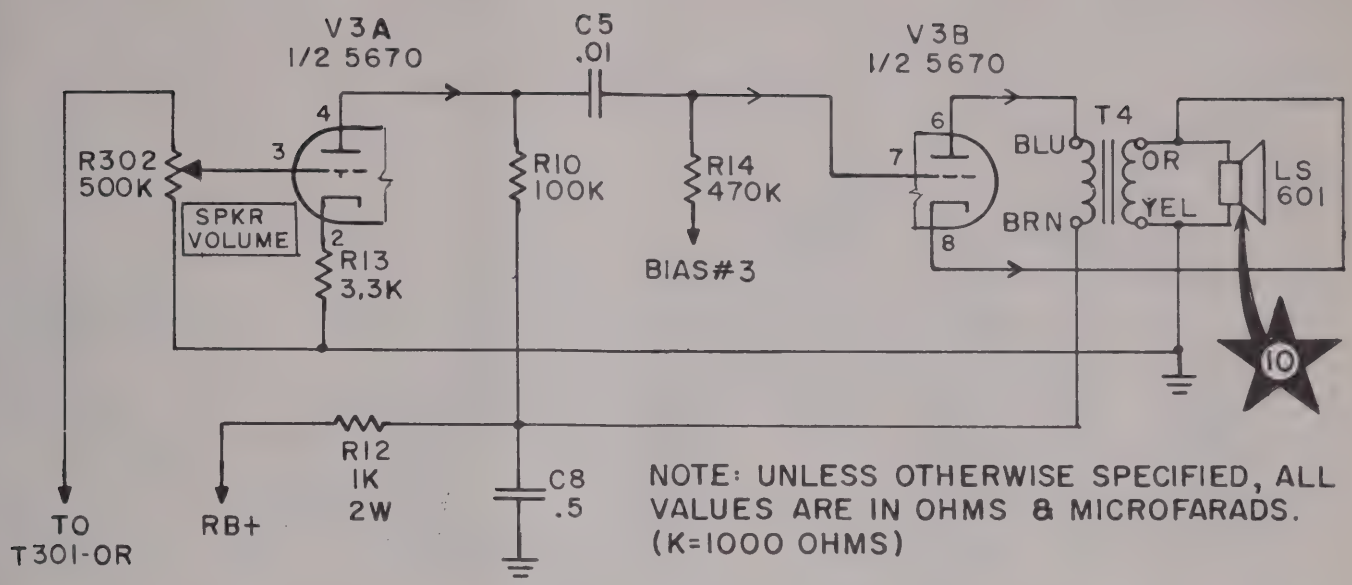


Figure 4–5. Amplifier, Electrical Control AM-1845/UXH-2, Speaker Amplifier Circuit

f. SPEAKER AMPLIFIER CIRCUIT (figure 4–5).– The speaker amplifier is an independent circuit whose input comes from the secondary of input transformer T301 through SPKR VOLUME potentiometer R302. R302 permits adjustment of the signal level to the grid of the first amplifier V3A. Output from V3A is coupled to the output stage V3B and thence through transformer T4 to the speaker LS601. The speaker is decoupled from B+ by R12 and C8.

g. TEST SIGNAL CIRCUIT (figure 4–6).–The test signal circuit consists of four switches, S104 marked STEADY, S103 marked START, S102 marked RECORD, and S101 marked STOP. These switches are used to simulate the tones that would be sent from an automatic transmiter. Use of the test switches to isolate circuit troubles or malfunctions is described in table 5–1, and table 6–7, steps 8 through 11.

The carrier signal for these tests is derived directly from the tuning fork oscillator buffer amplifier V202B and is a steady 3600 cycle signal. This signal is connected across R104 which is in series with the signal amplifier input transformer T301. Until one of the test signal switches is operated, R104 is shorted out and none of the 3600 cycles reaches the signal amplifier. V103 is a cathode coupled oscillator whose plate circuit is tuned to either 300 or 450 cycles depending upon the test switch used. The 60 cycle start signal is derived directly from the heater supply. The circuit functions as follows: When the START button S103 is pressed, the oscillator tunes to 300 cycles. This 300 cycle signal is developed across transformer T101. The diodes on the secondary side act as shorting switches and produce a square wave switching signal. This signal chops the 3600 cps signal to produce the modulated test tones which are fed to the bottom of transformer T301. The same action occurs for either the stop signal or the start record signal. When the STEADY button is pushed, the oscillator circuit is inoperative and the 3600 cycle signal is fed directly through to the bottom of the input transformer. When this circuit is not in use, the secondary of the input transformer is returned to ground.

h. VOLTAGE REGULATOR CIRCUIT (figures 4–7 and 4–8).–The voltage regulator circuit supplies 225 volts RB+ and bias supplies for the equipment.

Tubes V105 and V106 are connected in parallel and are used as series tubes in the regulator circuit. Resistors R133, R134, and R135 are used as suppressors to avoid parasitic oscillations. V104 is used as the difference amplifier, comparing a reference voltage obtained from the negative regulated bias suply with the RB+ voltage.

Resistors R128, R126 and R127 form a voltage divider between the RB+ output and the regulated negative bias supply. The grid of the difference amplifier is connected to the rotor of R126, the RB+ ADJUST potentiometer. The voltage from the rotor of R126 to the negative 105 volt supply is positive and a few volts less than 105, so that the voltage from V104 grid to ground is negative to bias this tube for Class A operation. If the RB+ tends to increase for any reason, the bias on V104 will decrease to increase its conduction and increase the voltage drop across its plate resistor

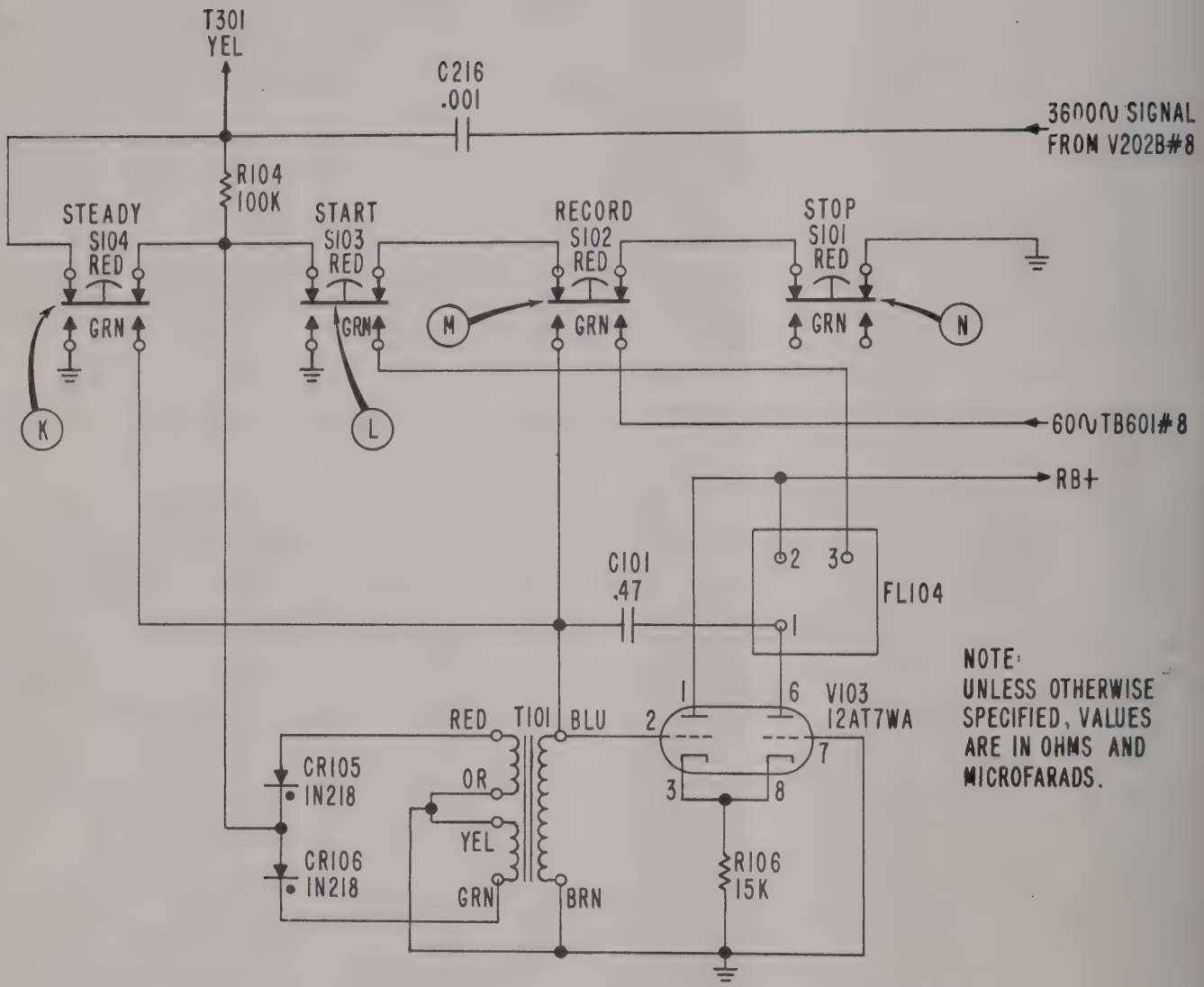
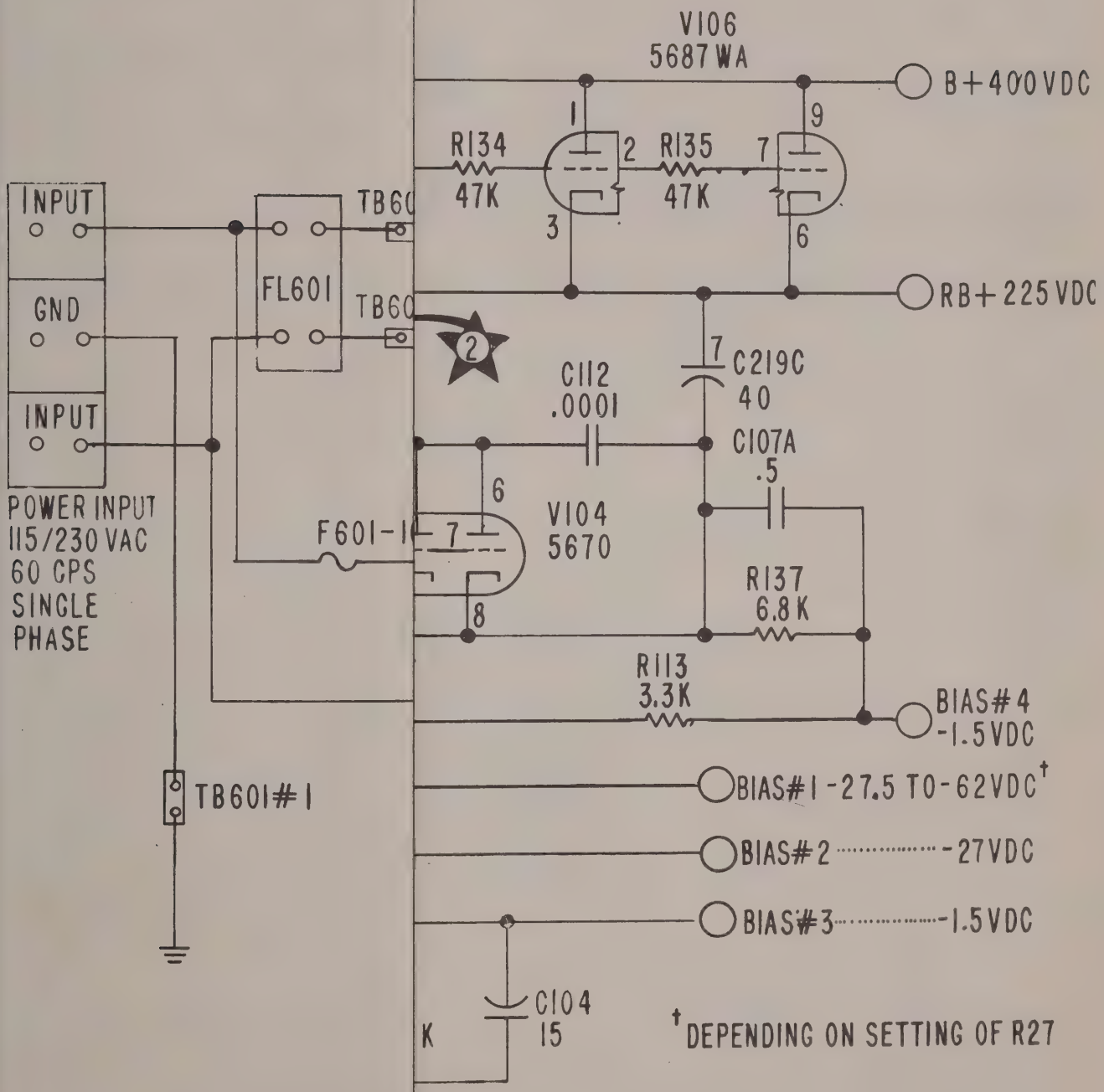


Figure 4–6. Amplifier Electrical Control AM-1845/UXH-2, Test Signal Circuit

R101. This increased drop increases the bias on V105 and V106 to restore the RB+ voltage to its regulated value. If the RB+ tends to decrease, the bias on V104 will increase to decrease its conduction and decrease the voltage drop across R101. This decreased voltage drop decreases the bias on V105 and V106 to restore the RB+ voltage to its regulated value. The use of a voltage reference makes a small percentage change in RB+ appear as a large percentage change in V104 grid bias. Assume the voltages shown in figure 4–8. A 5% increase in RB+ will cause a 5% increase in the voltage A, changing it from 100 to 105 volts. This causes the bias on V104 to change from —5 to 0 volts.

If the bias supply fails, the RB+ voltage will go to an extremely low value. V104 will conduct heavily with a resulting large voltage drop across R101. The large voltage drop across R101 places a high bias on V105 and V106 and hence results in a low value of RB+. This method provides extremely good protection for the print and sync motor tubes.



corder Set, Facsimile AN/UXH-2, Power Supply Circuit

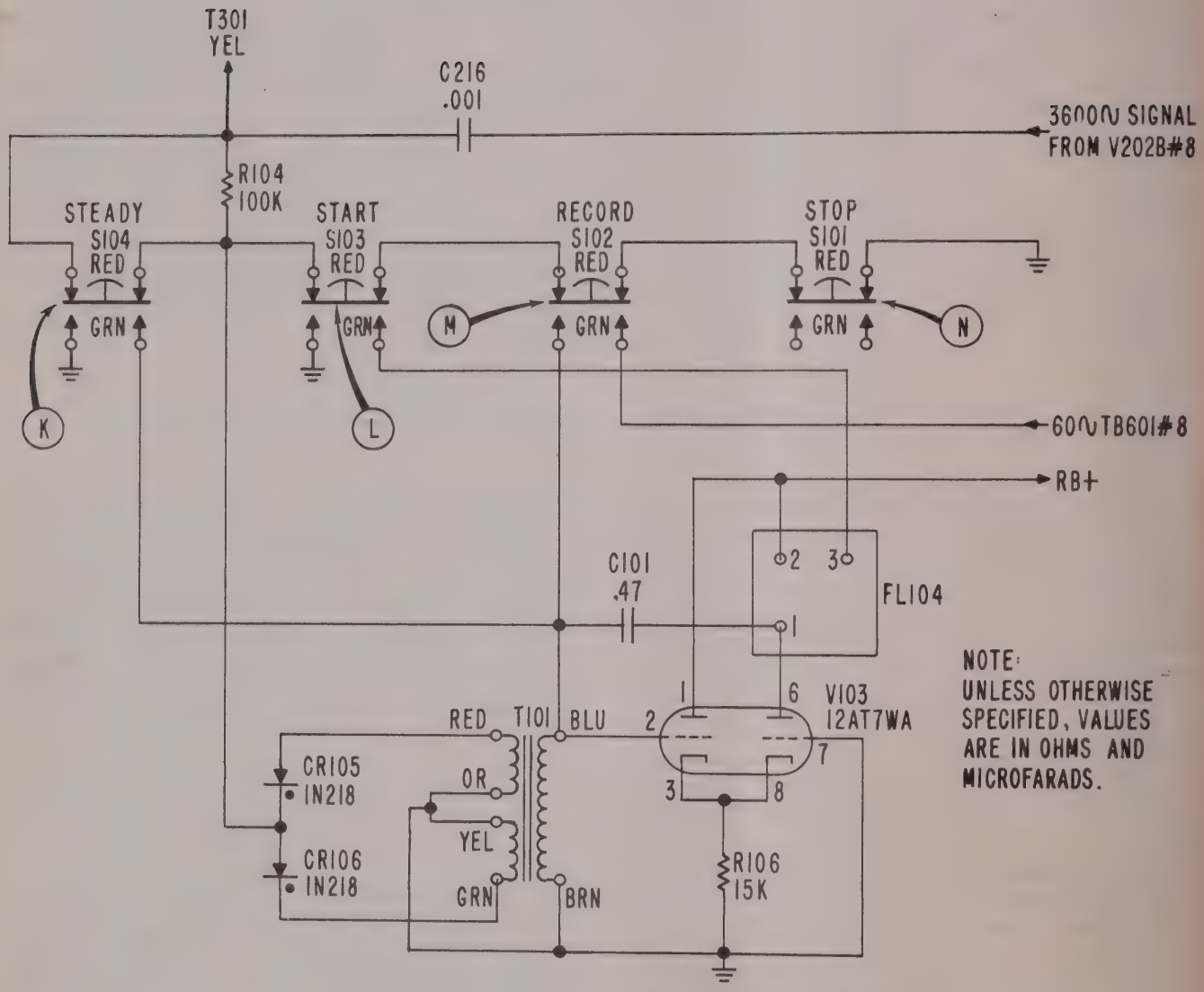


Figure 4–6. Amplifier Electrical Control AM-1845/UXH-2, Test Signal Circuit

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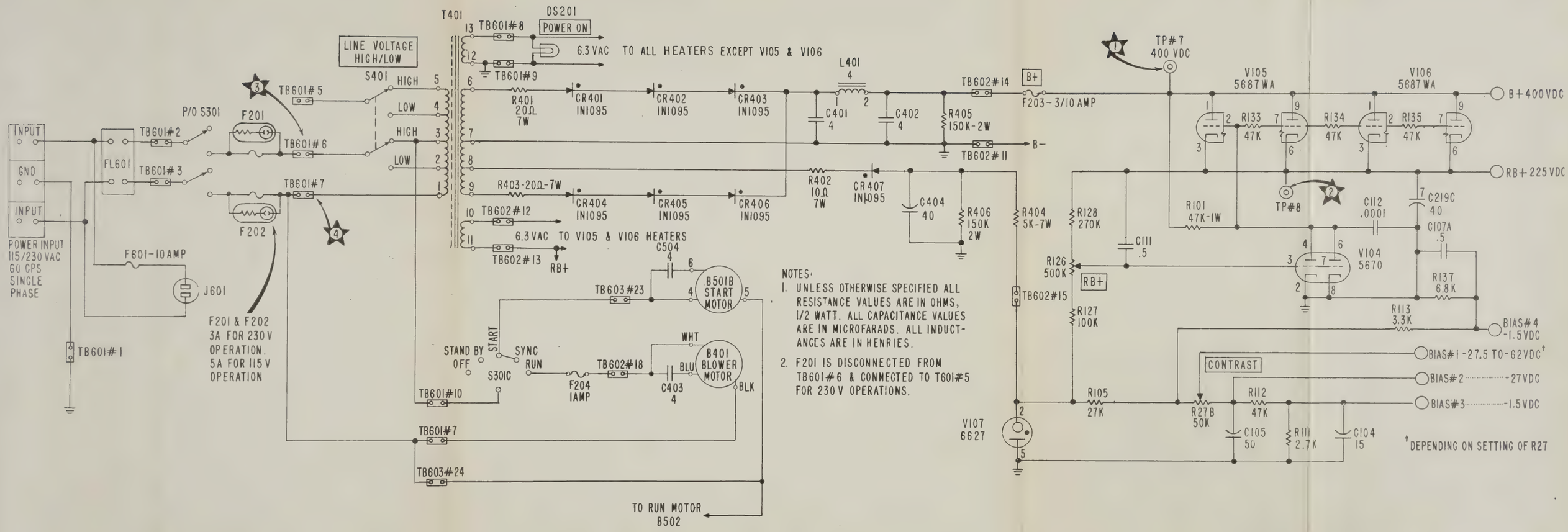
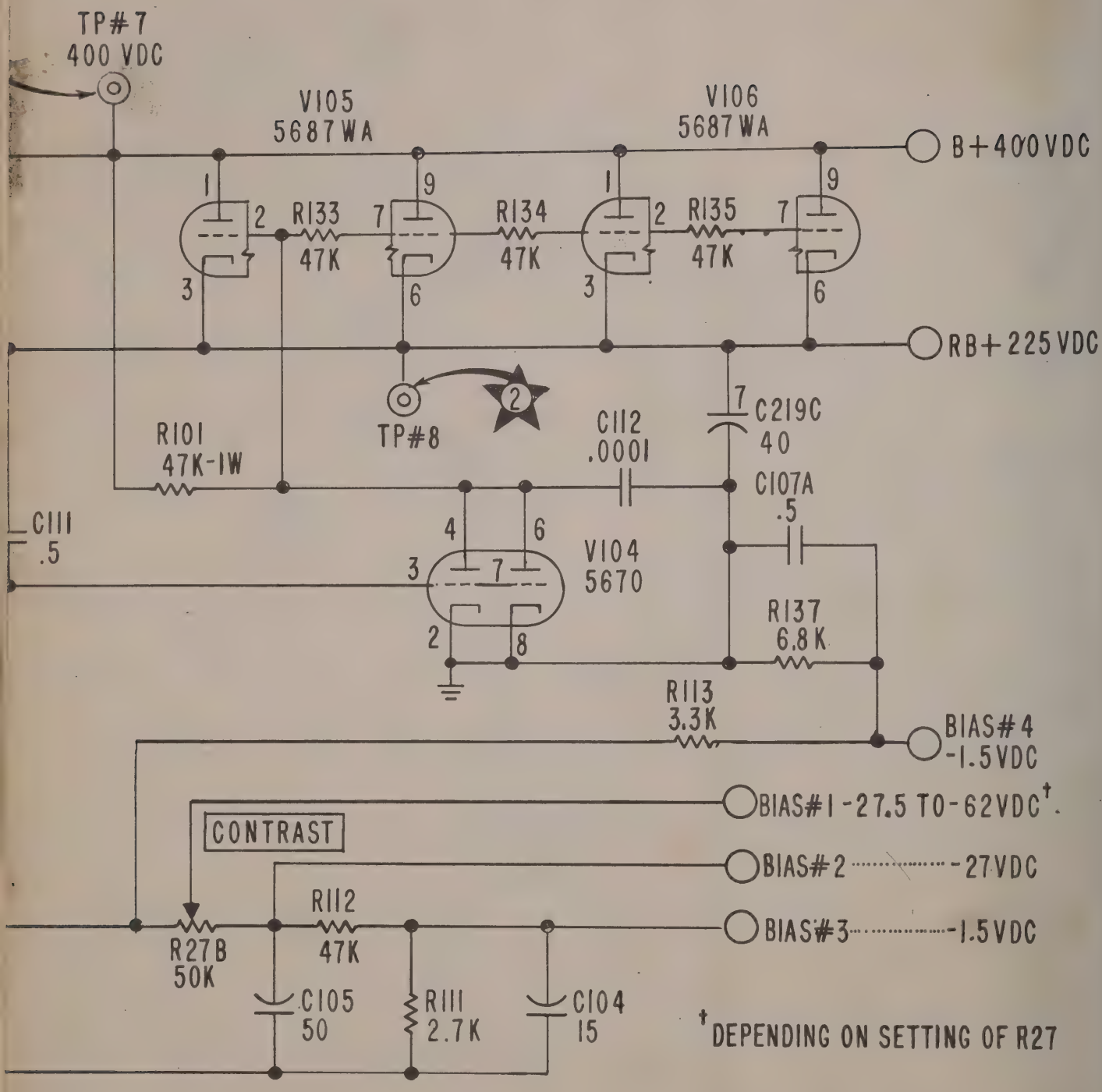


Figure 4-7. Recorder Set, Facsimile AN/UXH-2, Power Supply Circuit


TP#7
400 VDC
V105
5687WA
V106
5687WA
B+400VDC
R133
47K
R134
47K
R135
47K
RB+225VDC
TP#8
2
R101
47K-1W
C112
.0001
C219C
40
C107A
.5
C111
.5
V104
5670
R137
6.8K
R113
3.3K
BIAS#4
-1.5VDC
BIAS#1 -27.5 TO -62VDC†
CONTRAST
BIAS#2 -27VDC
R112
47K
R27B
50K
BIAS#3 -1.5VDC
C105
50
R111
2.7K
C104
15
† DEPENDING ON SETTING OF R27

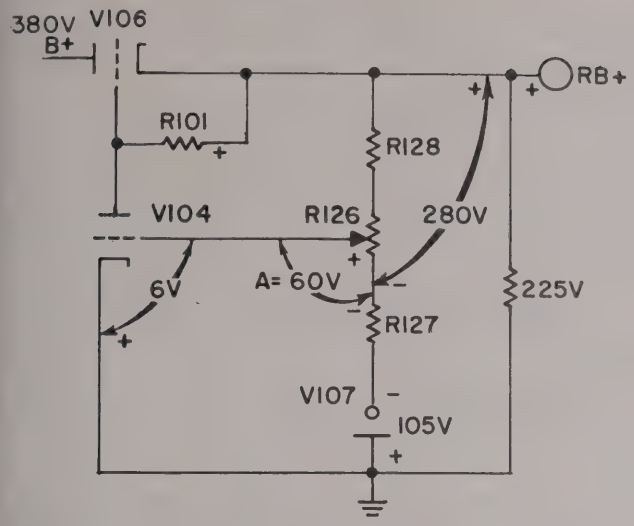


Figure 4–8. Recorder Set, Facsimile AN/UXH-2, Voltage Regulator Circuit, Simplified Schematic

4–3. POWER SUPPLY PP-1901/UXH-2 (figures 4–7 and 4–9). – The power supply furnishes 6.3 v AC for the heaters of all tubes, 400 v DC for the HI B+ and —105 v DC. A utility outlet J601 and 10 amp fuse F601 are provided on the AC line for utility or auxiliary equipment. Power line filter FL601 isolates the AN/UXH-2 from the power line for r. f. noise frequencies. Input from the AC power source goes through selector switch S301, LINE fuses F201 and F202, and the HIGH/LOW LINE VOLTAGE switch S401 to power transformer T401.

All the heaters except those of tubes V105 and V106 in the voltage regulator circuit are operated from one 6.3 volt secondary of the power transformer. The heaters of V105 and V106 in the B+ voltage regulator are operated from a separate 6.3 secondary, which is connected to RB+ to keep the heater to cathode voltage low.

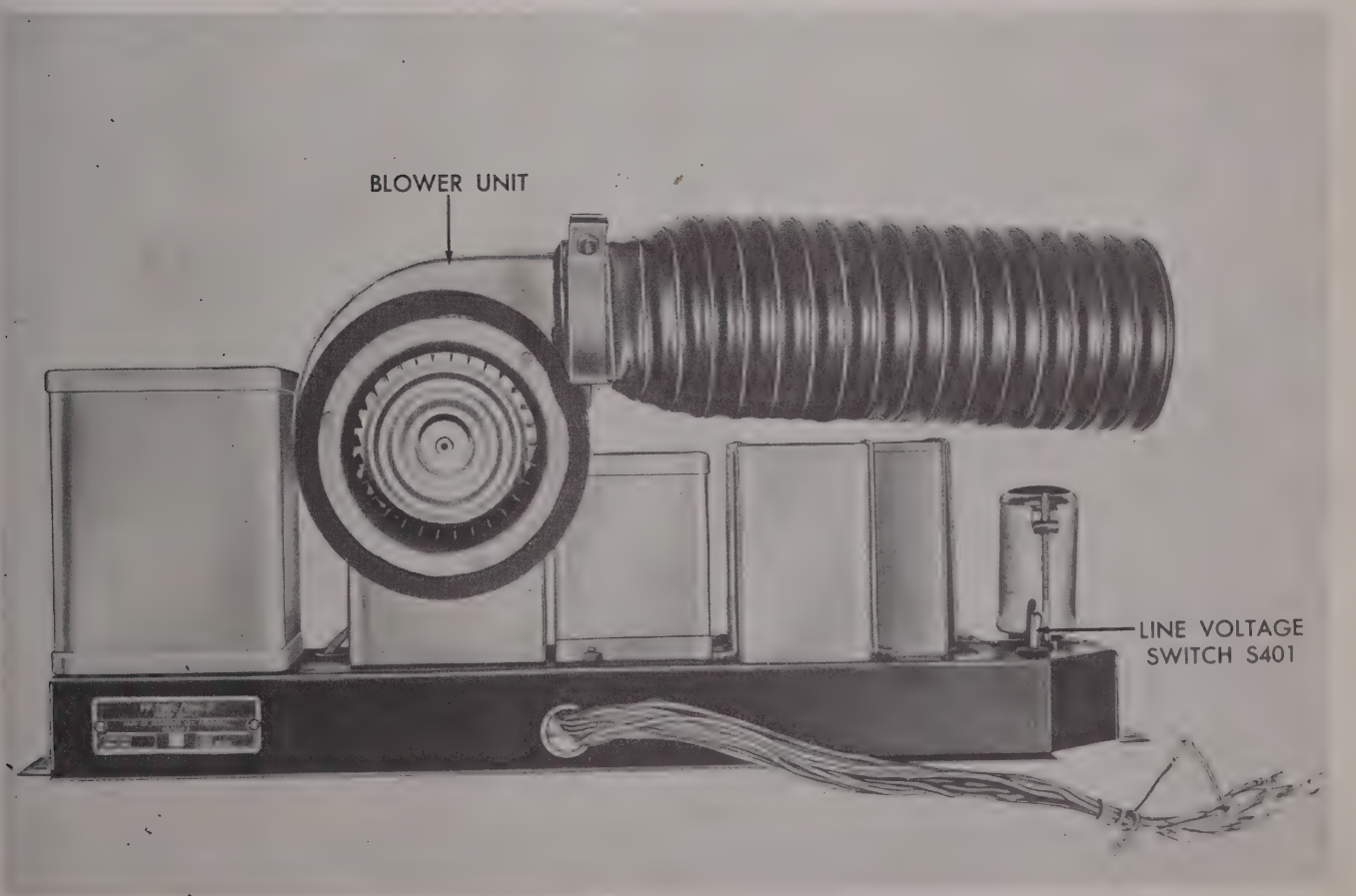


Figure 4–9. Power Supply PP-1901/UXH-2, Front View

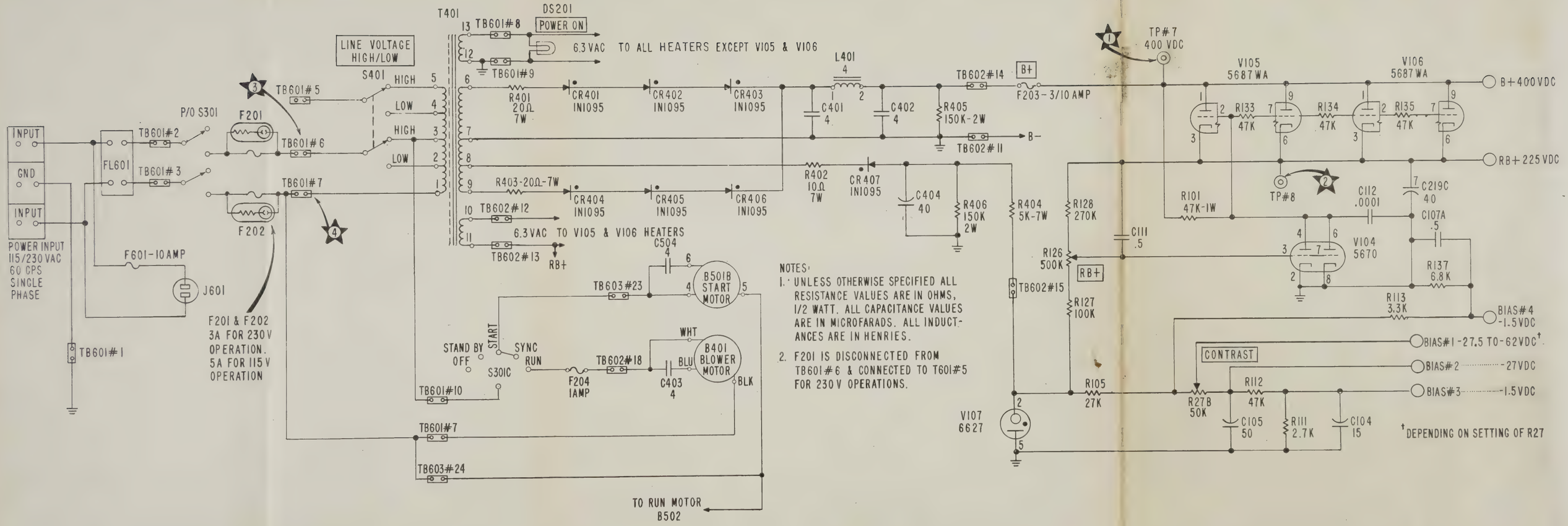
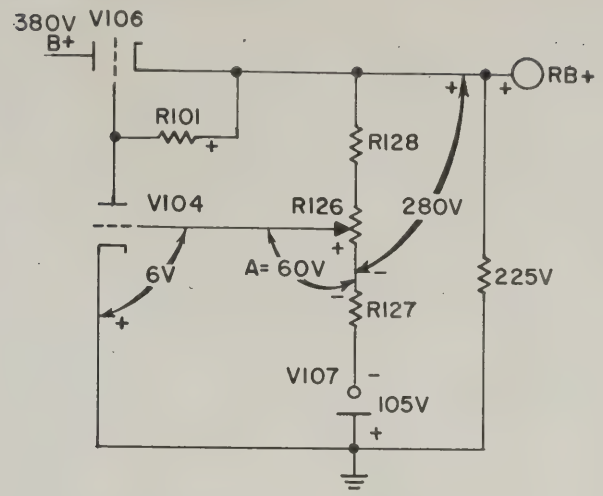


Figure 4–7. Recorder Set, Facsimile AN/UXH-2, Power Supply Circuit



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4–3. POWER SUPPLY PP-1901/UXH-2 (figures 4–7 and 4–9). – The power supply furnishes 6.3 v AC for the heaters of all tubes, 400 v DC for the HI B+ and —105 v DC. A utility outlet J601 and 10 amp fuse F601 are provided on the AC line for utility or auxiliary equipment. Power line filter FL601 isolates the AN/UXH-2 from the power line for r. f. noise frequencies. Input from the AC power source goes through selector switch S301, LINE fuses F201 and F202, and the HIGH/LOW LINE VOLTAGE switch S401 to power transformer T401.

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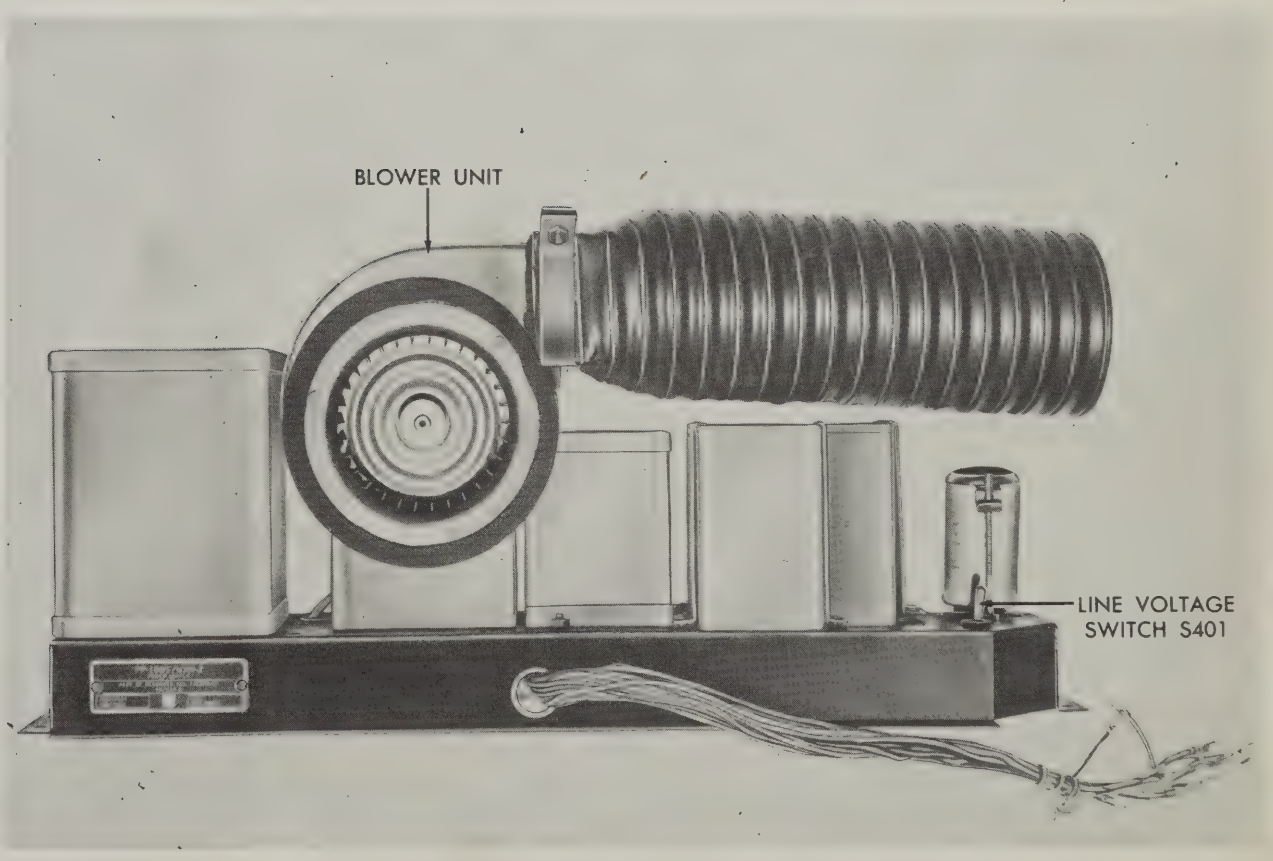


Figure 4–9. Power Supply PP-1901/UXH-2, Front View

4–4. RECORDER, FACSIMILE RO-76/UXH-2.

Recorder, Facsimile RO-76/UXH-2 (often referred to as the "mech unit") records by means of three stylus needles on a band carried by two pulleys. As the pulleys turn, the stylus needles (one at a time and at synchronous speed) move across the recording paper while the paper feeds from a roll in a direction perpendicular to the stylus movement. The recording mechanism consists of four assemblies: the sync system, the run system, the stylus and base assembly, and the paper feed assembly (figure 4–10).

The sync system, on the left end of the base casting, acts as a governor to control the speed of the stylus needles. It is coupled to the band through a unidirectional drive assembly which allows the sync motor to rotate even when the band is stationary.

The run mechanism, mounted on the right end of the base casting, drives the band above sync speed until it catches up with the unidirectional drive assembly in the sync system. The stylus needles are then maintained at sync speed by the sync motor.

The base casting, part of the stylus and base assembly, is the main structural support for the other mech unit assemblies. The two wheels mounted on the front face serve as pulleys for the flat stainless steel band that conveys the stylus needles across the recording paper. The run motor drives the band through the right run (or drive) wheel. The left wheel is an idler wheel, serving merely as a support for the band at the left side. The sync arm mounted behind the idler wheel catches each lug on the band to restrain the band to synchronous speed.

The paper feed assembly, mounted on the top of the base casting, holds the roll of recording paper and feeds it past the stylus needles. A gear train couples the paper feed assembly to the run motor to maintain the proper relationship betwen the rate of paper feed and the stylus speed.

A simplified diagram of the sync drive system is shown in figure 4–11 and explained in the following paragraphs.

a. SYNC MECHANISM (figures 4–11 and 4–12). –The main component of the sync mechanism is a synchronous motor which is a variable reluctance (LaCour phonic wheel) type with a 60-tooth rotor (figure 6–14). The motor is driven by a fork-controlled oscillator circuit to run at exactly 600, 900, or 1200 revolutions per minute as described in paragraph 4–2e above.

This motor is not self-starting but is brought up to speed by a split-phase induction start motor whose rotor is keyed to the sync motor shaft.

The sync shaft is driven by the sync motor through a reduction gear train, a flywheel and ratchet assembly and a sync clutch assembly. When the recorder is in standby condition, the sync motor is running (run motor, band and sync arm shaft stationary) and the sync clutch assembly is driven by a coupling pin riding against one

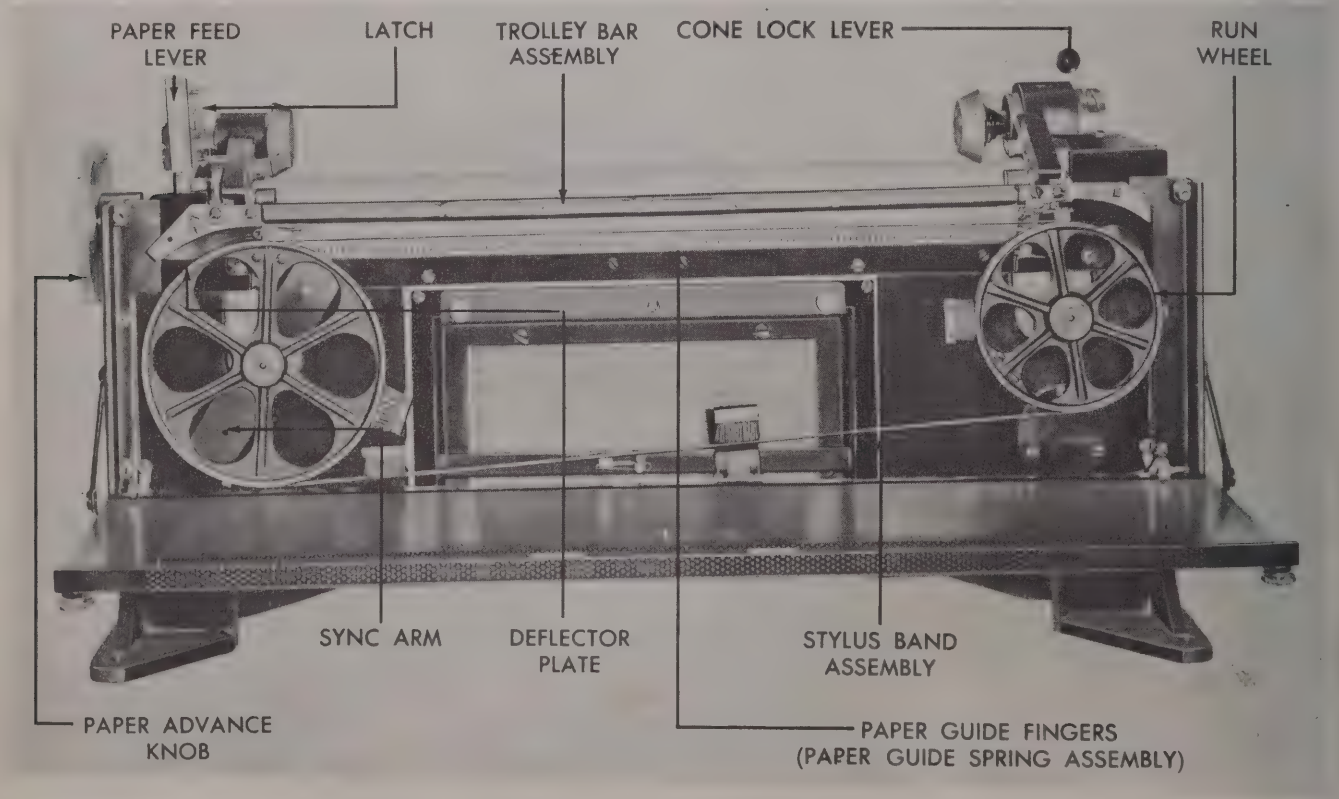


Figure 4–10. Recorder, Facsimile RO-76/UXH-2, Front View, Cover Open

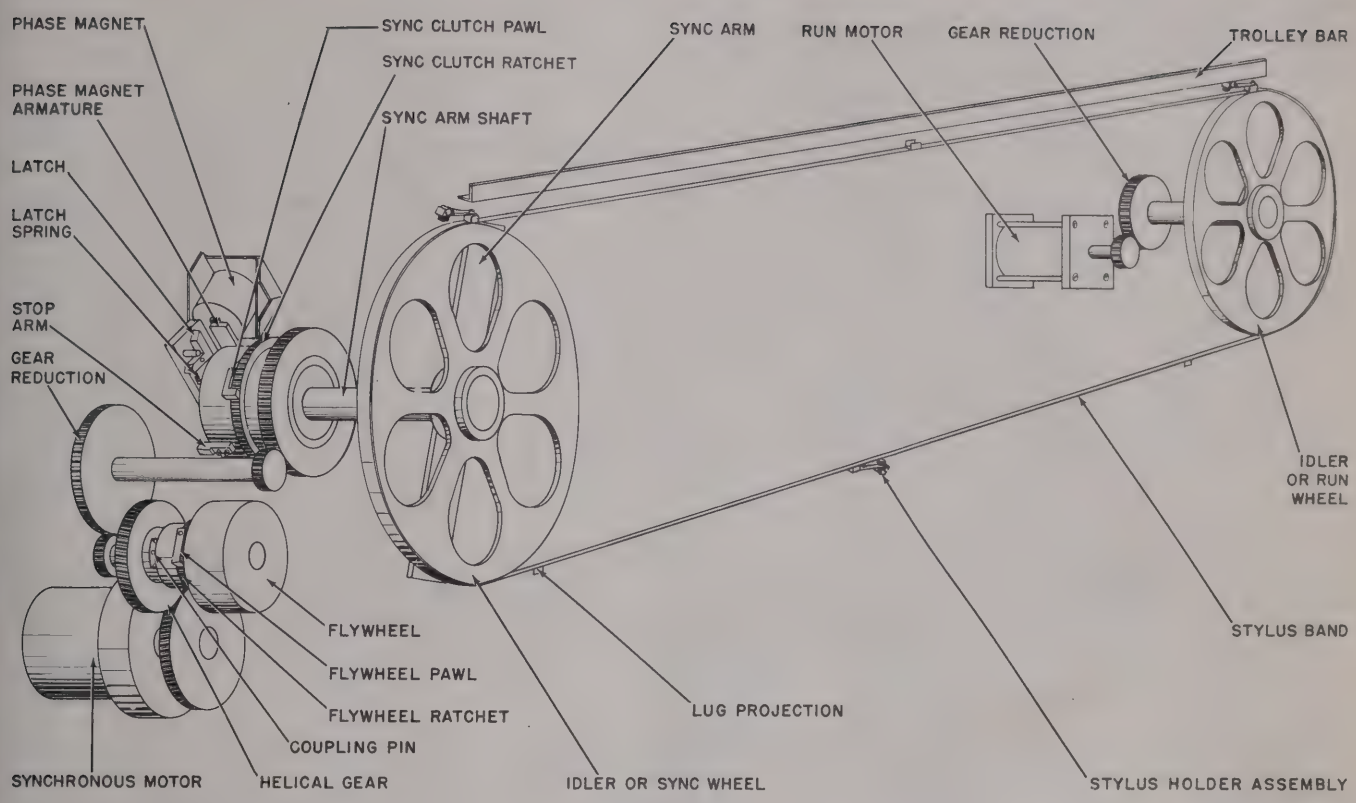


Figure 4—11. Recorder, Facsimile RO-76/UXH-2, Simplified View of Synchronous Drive and Run System

side of a hole in the hub of the helical gear on the flywheel shaft. The clutch stop arm trips past a spring-loaded latch which is attached to the stationary sync arm shaft. The latch spring restores the latch to position but is too weak to permit the clutch stop arm to drive the sync arm shaft. The armature of the phase actuator is normally held back so as not to engage the clutch stop arm.

During the phasing period, the holding current through the phase actuator which kept the armature pulled back is turned off. The released armature catches the clutch stop arm, but the ratchet continues to rotate at sync speed while the pawl slips over the ratchet teeth. When a phase pulse is received, the armature is pulled back momentarily to permit the clutch to resume rotating in phase at sync speed. Subsequent phase pulses will pull the armature back each time the stop arm passes it. As a result of this phasing process, the clutch stop arm is running in the correct phase relation with the remote transmitter.

When the start-record signal is received, the run motor begins to operate and drives the stylus band through a reduction gear train and the drive or run wheel. Lug projections on the band, drive against the sync arm, tending to drive the sync arm shaft and latch above synchronous speed. In a few seconds the latch will catch up to and drive against the clutch stop arm, thus bringing the stylus system down to sync speed and in phase.

When the band engages onto the sync arm and the stop arm, any speed excess above sync speed causes an impact to be delivered to the sync system. This impact is absorbed by the decoupled flywheel. The impact delivered to the sync system is transmitted through the sync gear system to the ratchet hub and rotates the hub forward. The coupling pin which has been riding against one side of a hole in the helical gear is shifted to contact on the other side of the hole. The sync motor prevents any further rotation of the coupling pin and hub, and limits the rotation to synchronous speed. During this shift, the impact is passed to the flywheel by means of the pawl bearing against the ratchet plate. After receiving the impact, the flywheel, which is now above sync speed, rotates freely ahead of the ratchet plate and hub. The flywheel gradually dissipates the impact energy as losses and eventually slows down to rotate again with the ratchet plate and hub at sync speed.

b. RUN MECHANISM (figure 4–11 and 4–13.) – The run system supplies the driving power for the recording components. It is at the right side of the stylus and base casting and utilizes a servo motor geared down to drive the run wheel through a frictional slip clutch. The clutch slips at the instant the run system catches up with the sync system and aids the flywheel in preventing the sync motor from being "knocked out" of synchronism by sudden application of run power.

c. STYLUS AND BASE ASS'Y (figures 4–10 and 4–11). – The stylus band is driven by the run wheel on the right side and supported by the idler wheel on the left. The path of travel of the band parallel to the drum surface is restricted by a thin wire mounted on the periphery of both wheels which runs in a groove on the under side of the stylus band.

The sync arm restrains the band to rotation at synchronous speed as explained in paragraph 4–4*a*. The lugs which are welded to the continuous stainless steel band serve two functions – to suport the stylus holders, and to position the stylus needles properly upon the paper. As one lug leaves the control of the sync arm, the next lug has engaged the opposite end of the sync arm.

The stylus holder assembly (figure 4–14) is fastened to the band by means of a beryllium copper leaf which is insulated from the band by a nylon block. This leaf spring loads the stylus holder against the trolley bar which is located above the path of the stylus needles. The trolley bar not only serves to generate a straight path for the stylus needles but also conducts current to them. A chrome plated deflector plate mounted below the left end of the trolley bar lifts the stylus as it approaches the left edge of the drum and drops it on the recording paper.

Brushes on the front face of the base casting clean the wheels and the underside of the band.

d. PAPER FEED ASSEMBLY (figure 4–15). – The paper feed assembly mounted on top of the base casting consists essentially of the paper roll supports, paper feed gear box, pressure roller assemblies, the paper feed drum, and the paper advance knob.

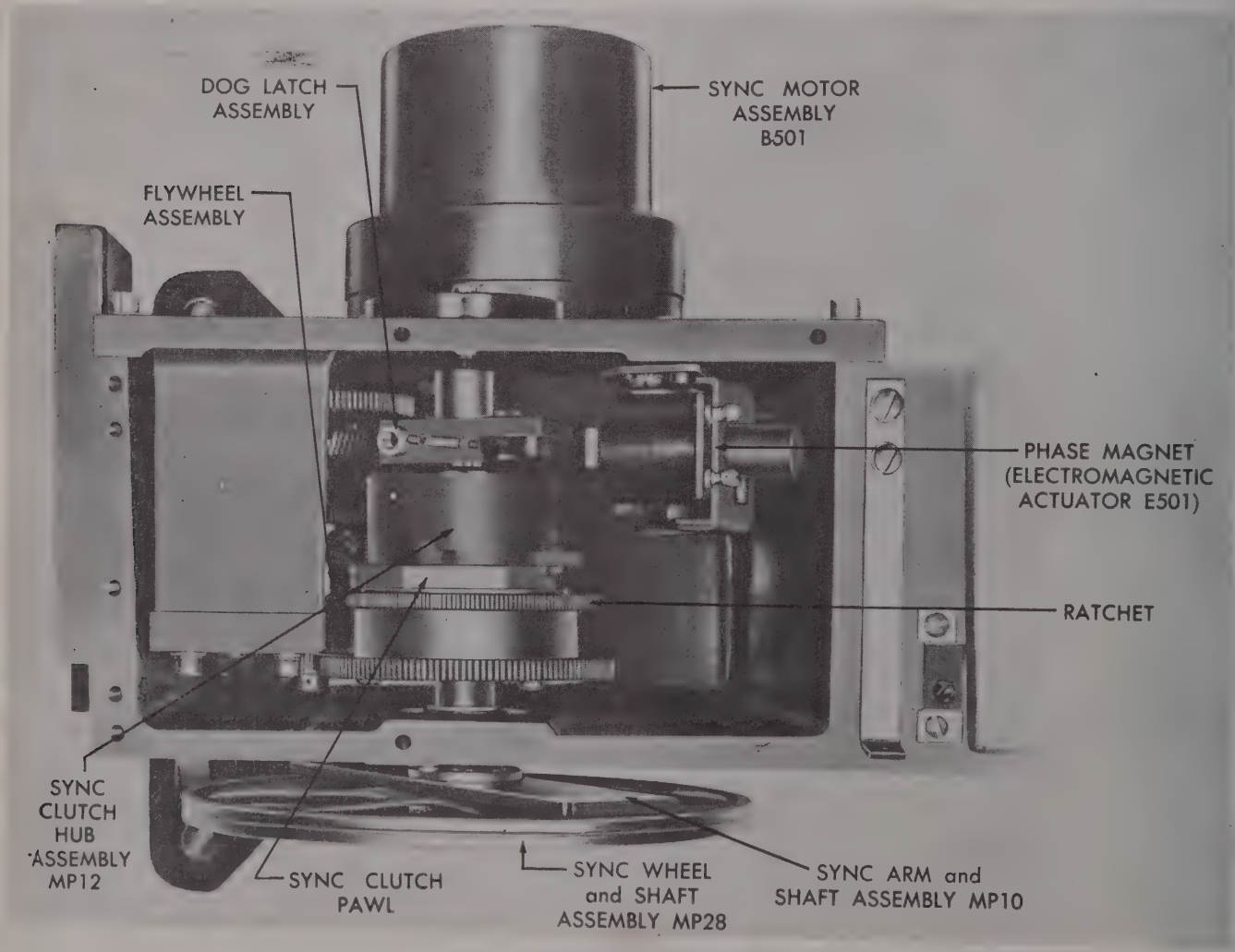


Figure 4–12. Recorder, Facsimile RO-76/UXH-2, Sync Mechanism

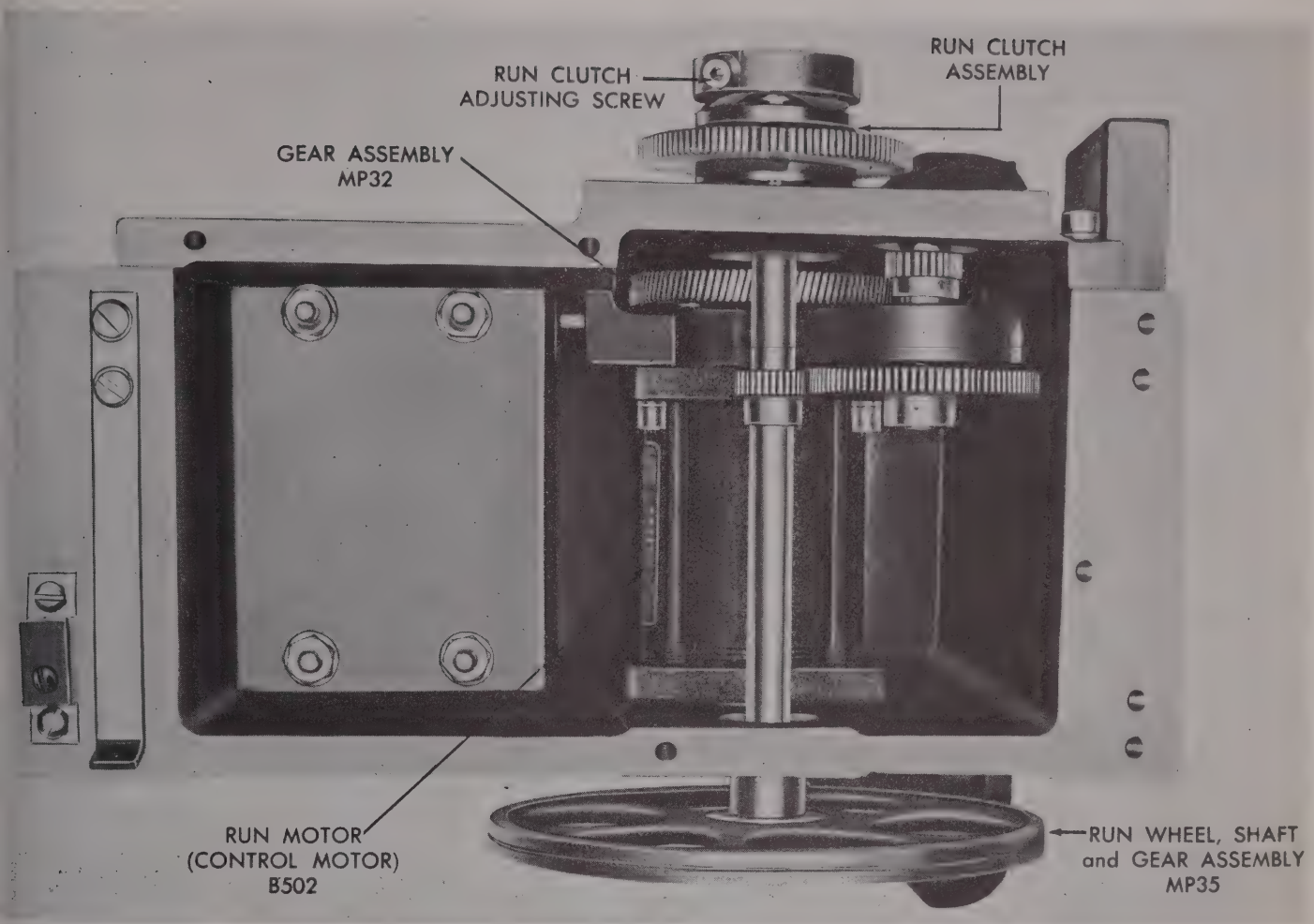


Figure 4–13. Recorder, Facsimile RO-76/UXH-2, Run Mechanism

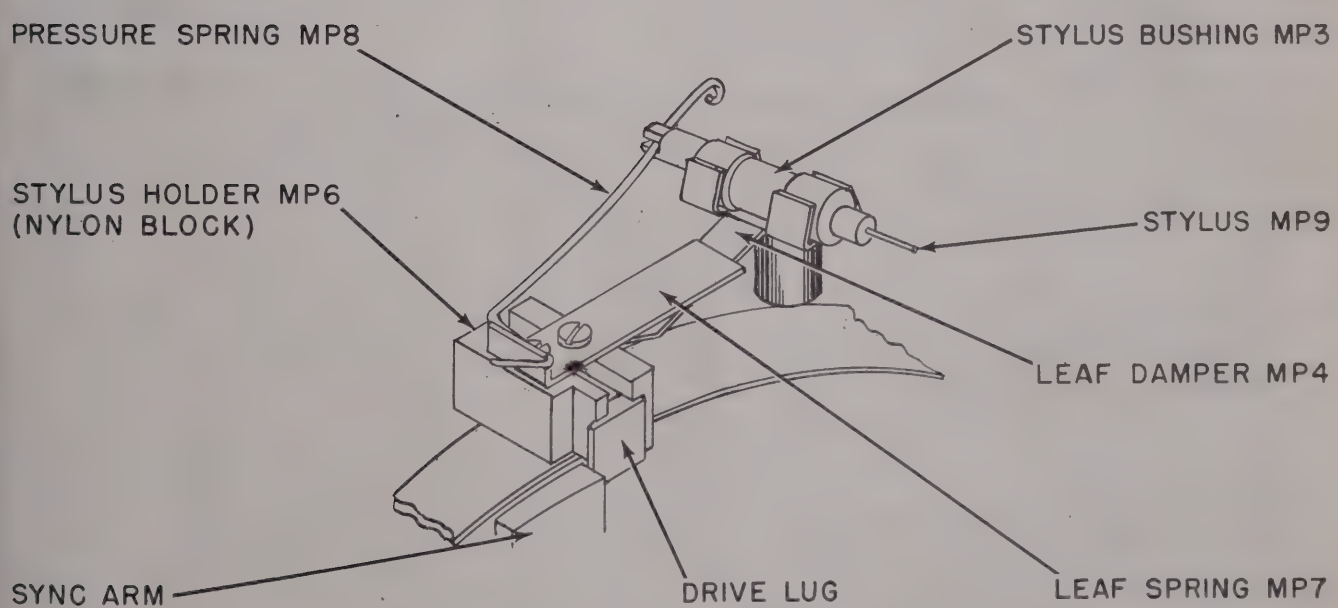


Figure 4–14. Stylus Holder Assembly

The paper feeds from a roll supported on the two cones, down around the bottom and up past the front of the drum. Friction between the drum and the pressure rollers feeds the paper.

The two paper roll supports are conical in shape with sharp teeth to bite into the core of the paper roll and prevent slipping.

The right hand cone is spring-loaded and holds the roll in position against the left cone. A locking device is provided to hold the right hand cone in position. A cone shaft slides through a unidirectional clutch under the action of a spring bearing on the cone. The cone rests inside the paper roll core and holds the roll in position. Any forces that tend to move the cone out of position would move the shaft backwards, causing the locking balls of the clutch to wedge in place between the shaft and the internal conical surface. For loading of paper, the wedging action is removed.

When the equipment is loaded with a roll of paper, the pull on the paper rotates the cones and applies tension to a spring on the left cone shaft. When the paper has been used up (or when there is no paper in the machine), the released spring returns the left cone to a position where a pin projecting from a slip clutch at the end of the left cone shaft activates the end-of-paper microswitch on the base casting. The slip clutch provides friction drag for the recording paper and also permits the cone shaft to continue rotating when the projecting pin meets a stop in front of the shaft.

The gears in the paper feed gear box drive the drum from the run gear train at the proper rate. A unidirectional clutch inside the paper feed gear box allows the drum to be revolved by hand to permit loading of the paper. Another unidirectional clutch inside the hub of the manual paper advance knob prevents the drum being turned in the wrong direction.

A shear pin in the paper feed clutch and rachet assembly protects the paper feed gear train from damage due to any unusual binding condition or locking up of the paper feed drive.

The paper feed pressure rollers are driven directly from the drum shaft by spur gears mounted on each end. A cam locks the pressure roller arms in position to prevent release under vibration.

The entire assembly provides the proper feed of the paper with respect to the stylus needles.

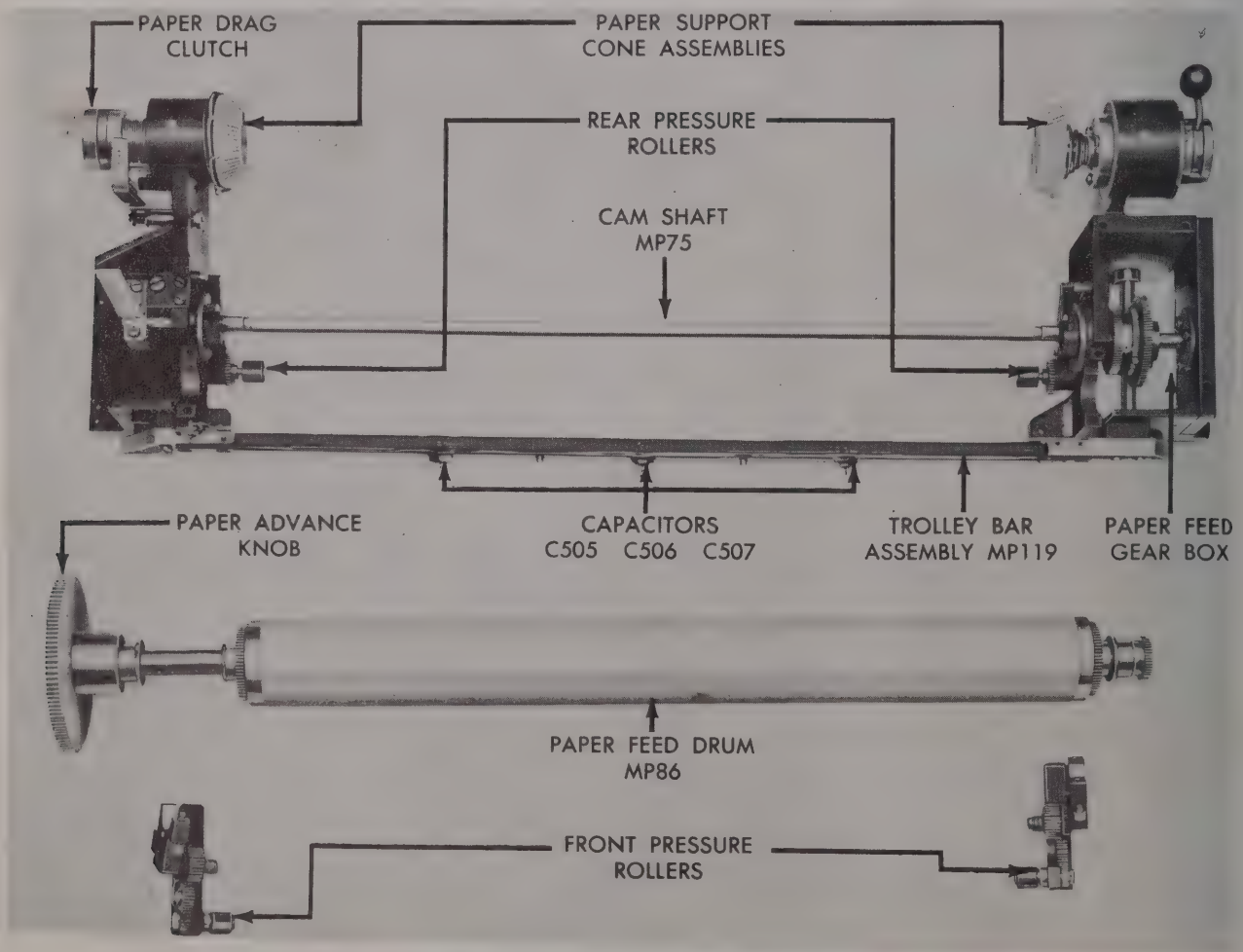


Figure 4—15. Recorder, Facsimile, RO-76/UXH-2, Paper Feed Mechanism

SECTION 5
TROUBLE SHOOTING

5–1. GENERAL.

Trouble in a facsimile recorder usually can be localized from visual and audible indications. For instance, if the recorder is out of synchronism with the transmitter, the recorded copy will be completely illegible (figure 5–1A). If the recorder is not phasing properly, the edge of the recorded copy will not coincide with the edge of the recording paper and a black bar will appear between the edges of the copy (figure 5–1B). A jagged vertical line which should normally be straight (figure 5–1C) indicates a stylus needle is bent or out of alignment. A low signal from the line is indicated by low signal from the loudspeaker. If the incoming signal is strong but the recorded copy is light and cannot be made dark, the signal amplifier section is probably at fault.

Use of the internal test switches and test points to isolate trouble is described in paragraph 5–3*c* and tables 5–1 and 6–7.

5–2. TEST EQUIPMENT AND SPECIAL TOOLS.

Two alignment fixtures, one for the stylus holder and the other for the stylus needle itself, are mounted in the tool box (figure 5–2) under the cabinet hood, together with a small screw driver, retainer ring pliers and hex keys. Use of the fixtures is described in paragraphs 3–6*e* and 3–6*f*.

The following additional equipment is necessary for measuring voltages, resistances, checking wave shapes, etc.:

MULTIMETER AN/USM-34 or service equivalent. Use for DC resistance and AC voltage measurements on trolley and sync motor.

AUDIO LEVEL METER AN/URM-38. Use for measuring signal line level from facsimile transmitter.

OSCILLOSCOPE AN/USM-32 and AUDIO OSCILLATOR TS-382/U can be used for checking wave shapes.

VOLTMETER, ELECTRONIC ME-6A/U. Use for measuring all signal voltages.

5–3. OVERALL TROUBLE SHOOTING.

a. PRELIMINARY CHECK. – When looking for the cause of trouble, keep in mind that the fault will not always be found in the equipment. The operator may have failed to perform one of the required functions at the proper time, or there may be interference such as intermittent or spurious signals from the transmission line. Or faulty operation of the transmitter may have caused the trouble. If the background prints a light gray, the transmitter contrast may be set too low, or there may be extraneous signals in the transmission circuit. Partial tone reversal in the recorded copy also indicates the transmitter contrast was set improperly. If the recording is a group of vertical lines, the transmitter drum is not feeding.

Mechanical failure may cause trouble as well as defective or incorrect electrical components or wiring. When mechanical faults are present, they must be eliminated before the electrical circuits can be properly adjusted.

Before trying to isolate trouble, an overall visual check should be made to see that the power cord and signal leads are properly connected to the terminals at the rear of the equipment, and that the interconnecting cables are properly connected to the barrier strips (paragraph 2–4 and figure 2–2). The position of the LINE VOLTAGE switch and the LINE fuses should be appropriate for the operating voltage (paragraph 2–4). Check that none of the blown fuse indicators light when the equipment is turned on.

An overall check of the recorder functions can be achieved by recording copy sent from a compatible transmitter or by the use of the test switches in the center front of the electrical chassis. These switches apply simulated start, start record and stop signals to the amplifier circuits and also permit steady or modulated signals to be applied to the stylus needles. Their use is described in paragraph 5–3*c* and tables 5–1 and 6–7.

b. CONTROL SETTINGS.–When checking operation of the recorder by means of the test switches or when receiving from a transmitter capable of sending control signals, the AUTO/MAN switch and GAIN control should each be at AUTO. If recording from a transmitter which does not send start, start record and stop signals, the AUTO/MAN switch should be at MAN and the equipment will have to be phased, started and stopped as in normal manual operation (paragraph 3–3*c*).

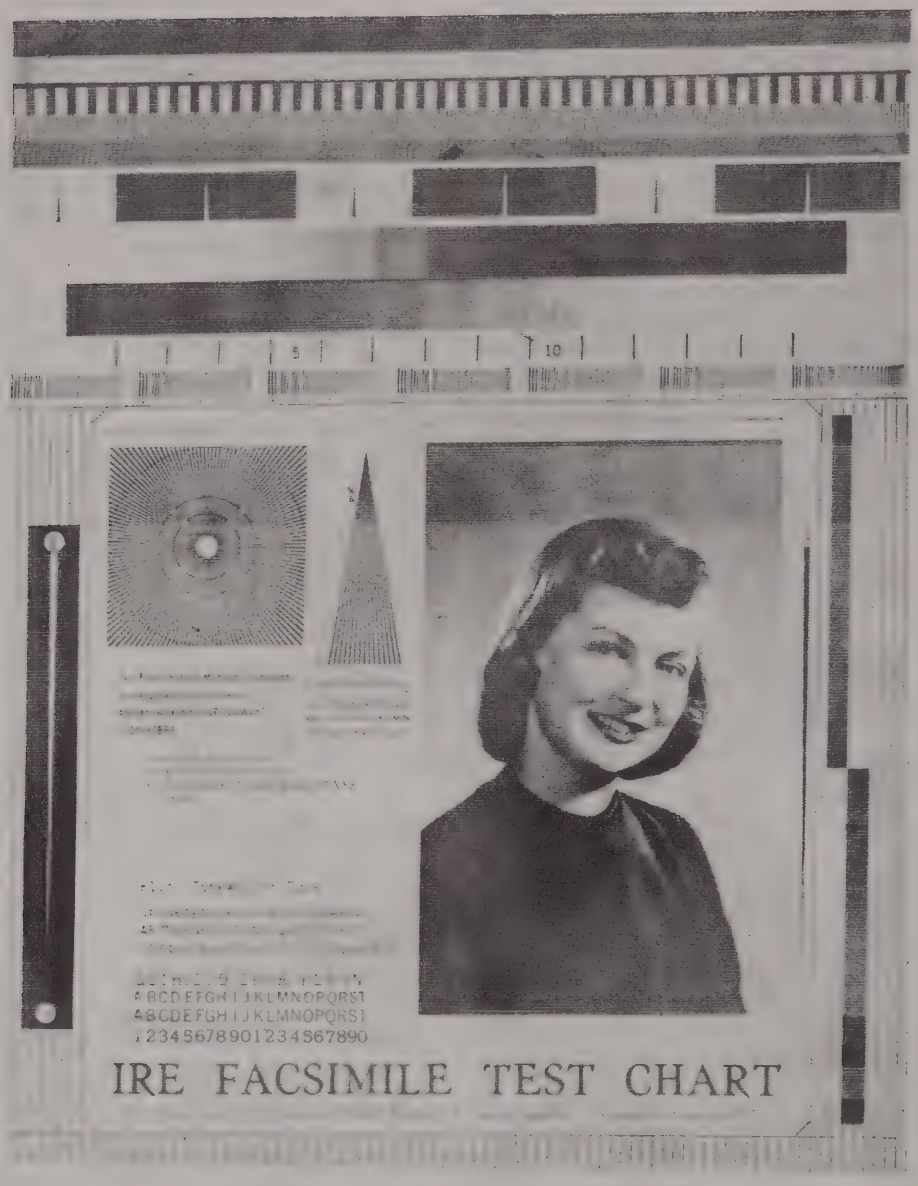
Correct settings of the internal maintenance controls are described in paragraph 6.3–2.

c. TEST SWITCHES. – Use of the pushbutton test switches S101, S102, S103 and S104 to simulate control signals and check the equipment operation is outlined in table 5–1.

Before using the switches, remove the signal cable plug P101 from the electrical chassis. This opens up the incoming line and eliminates the possibility of the test tones getting back into the input line circuit.

When the test switches are used, both the AUTO/MAN and GAIN controls should be set at AUTO.

EXAMPLE OF A STANDARD RECORDING



EXAMPLES OF FAULTY RECORDINGS

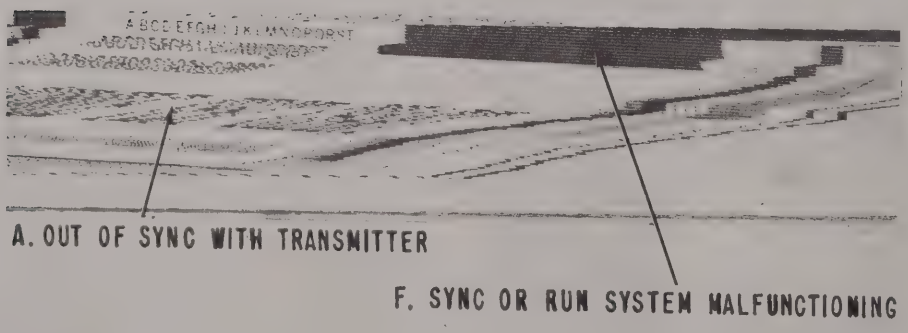
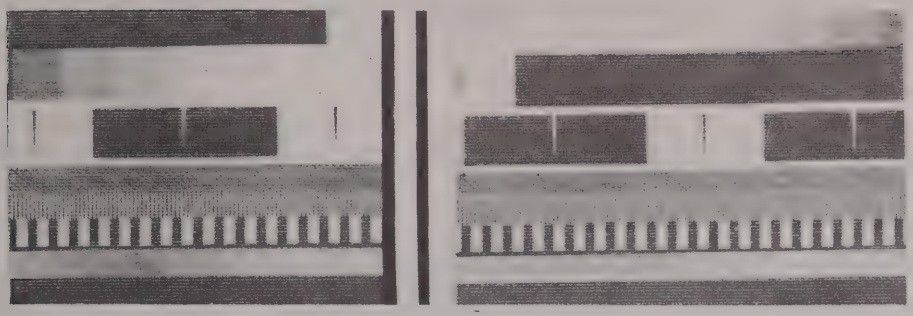
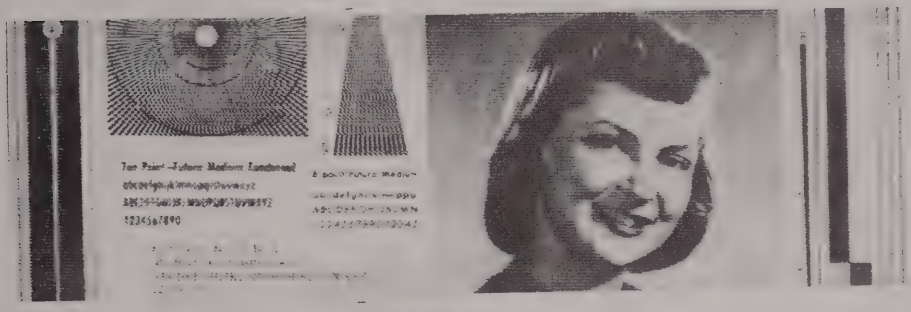


Figure 5—1. Examples of Good and Faulty Recordings

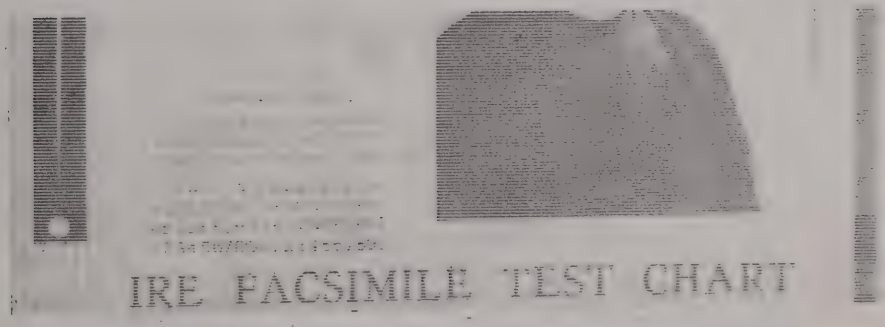
EXAMPLES OF FAULTY RECORDINGS



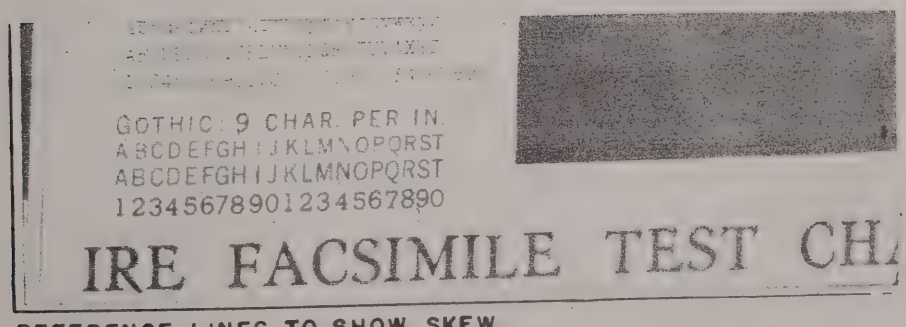
B. IMPROPER PHASING



C. STYLUS BENT OUT OF ALIGNMENT



D. LINE GROUPING



REFERENCE LINES TO SHOW SKEW

E. OFF FREQUENCY – FORK NOT OSCILLATING AT 2400 CPS

TABLE 5–1. RECORDER SET, FACSIMILE AN/UXH-2, SYSTEM TROUBLE SHOOTING

STEP	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1	Turn selector switch to RUN.	Sync motor tone (1200, 900, or 600 cps — switch S302 at 120, 90, or 60 respectively) should be heard. STAND BY indicator light should glow. Blower motor should start.	If sync motor doesn't start or doesn't fall into sync, check setting of sync MOTOR CONTROL (par. 6.3—2*a*) and motor drive circuit (table 5—4). If the blower motor doesn't start check contacts of selector switch S301 section C, fuse F204 or the motor itself.
2	Press START test button for 5 seconds.	STAND BY light should go out and PHASE light come on.	If operation is not normal, check relay K101 and automatic control circuits (table 5—3).
3	Press STEADY button and release it momentarily.	Buzzing sound should be heard as released phase magnet armature holds back the sync clutch stop arm. Buzzing should stop momentarily when STEADY button is released.	Do nothing unless recorded copy is out of phase. If no buzzing is heard or buzzing continues after STEADY button is released, check the phase actuator armature (par. 6.3—4*j*), the phasing circuit (table 5—3), and the setting of the PHASE CONTROL (par. 6.3-2g).
4	Press RECORD button for 5 seconds.	PHASE light should go out and RECORD light come on. The run motor should start and the band start rotating.	If operation is not normal, check the automatic control circuits (table 5—3) or the run system (table 5—9).
5	With SCANS/MIN switch at 60, record several inches of modulated signal by pressing START button and several inches of signal by pressing STEADY button.	A pattern of about 300 dots per line should be recorded when the START button is pressed (60 scans) and straight lines across the paper when the STEADY button is used.	If recording is very light, check the signal amplifier and ALC circuits (table 5—2), setting of CONTRAST CONTROL (par 6.3—2*f*), and the stylus needles & trolley bar (par. 6.3—4*b, c, d*). Check signal input level & power line voltage. If there is line grouping (fig. 5—1D,) if portions or all of one scan line are missing, or if there is jitter in a repetitive pattern, check stylus assemblies (table 5—10). Jitter may also mean a poorly positioned deflector plate (par. 6.3—4*e*). Line grouping may also indicate erratic paper feed (table 5—11). If the background prints a light gray, check setting of CONTRAST CONTROL (par. 6.3—2*f*). Horizontal streaks across the paper may indicate a malfunctioning paper feed system (table 5—11). If band is not running properly, check sync system (table 5—8) or the run system (table 5—9). If the band lugs are slipping by the sync arm, replace the band (par. 3—6*d*). If the sync motor drops out of sync when the band starts moving, check the MOTOR CONTROL (par. 6.3—2*a*), the motor drive circuit (table 5—2), the sync system (table 5—8), or the run slip clutch (par. 6.3—4*g*). If the band moves but the stylus needles do not print, check amplifier and print circuits (table 5—2), and that the stylus needles are not too short (par. 3—6*a*). If a recording is out of phase, check the phase actuator (par. 6.3—4*j*), the phasing circuit (table 5—2), the sync mechanism (table 5—8), and check the band for indexing on the right lug (par. 3—6*d*).
6	Press the STOP button for 5 seconds.	Recording should stop. RECORD light should go out and STAND BY light come on.	Check automatic control circuit (table 5—3).

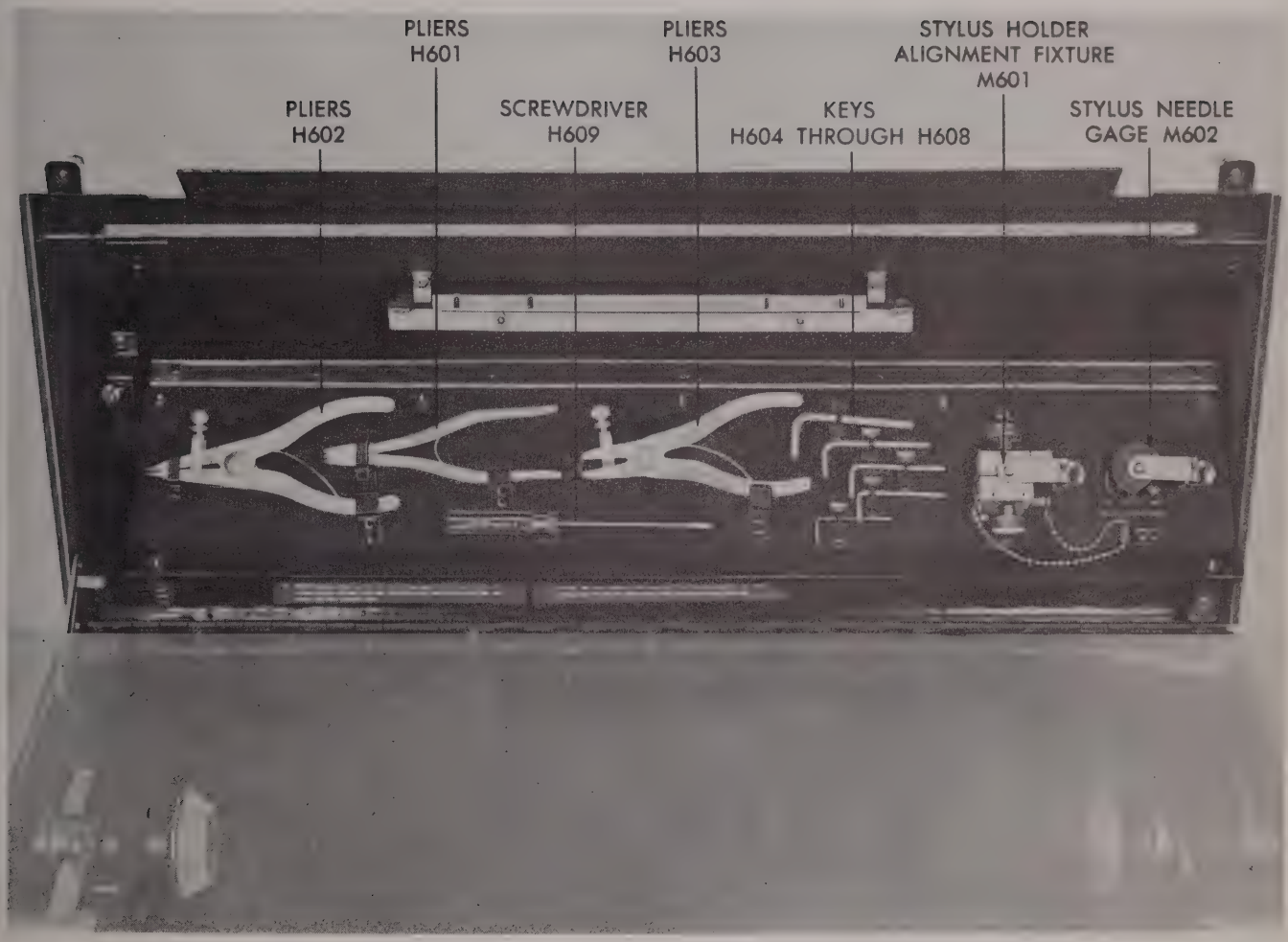


Figure 5–2. Recorder Set, Facsimile AN/UXH-2, Tool Plate Assembly

5–4. FUNCTIONAL SECTION TROUBLE SHOOTING.

Examination of the recorded copy will help isolate the particular section of the recorder which is giving trouble. Reference to the voltage and resistance measurements in paragraphs 5–4*c* and wave shapes and indications described in tables 5–2 through 5–11 will also help isolate trouble. Figure 5–3 shows the location of test points and the maintenance controls.

a. CONTROL SETTINGS.–Adjustment of the maintenance controls is described in paragraph 6.3–2.

b. FUNCTIONAL SECTION TROUBLE SHOOTING CHARTS.–Explanation and schematic diagrams of the circuits of these functional sections and explanation of the mechanical functions are given in Section 4. Refer to figures 4–2 through 4–15.

Figure 5–4 shows the primary power distribution.

Determination of the cause of trouble when the recorder does not function properly usually requires checking first in one portion of the recorder and then making the next step in a different portion of the recorder. For this reason table 5–12, Recorder Set, Facsimile AN/UXH-2, Typical Troubles, should be used for diagnosing troubles. Functional system trouble charts (tables 5–2 through 5–11) are included for reference after first using table 5–12.

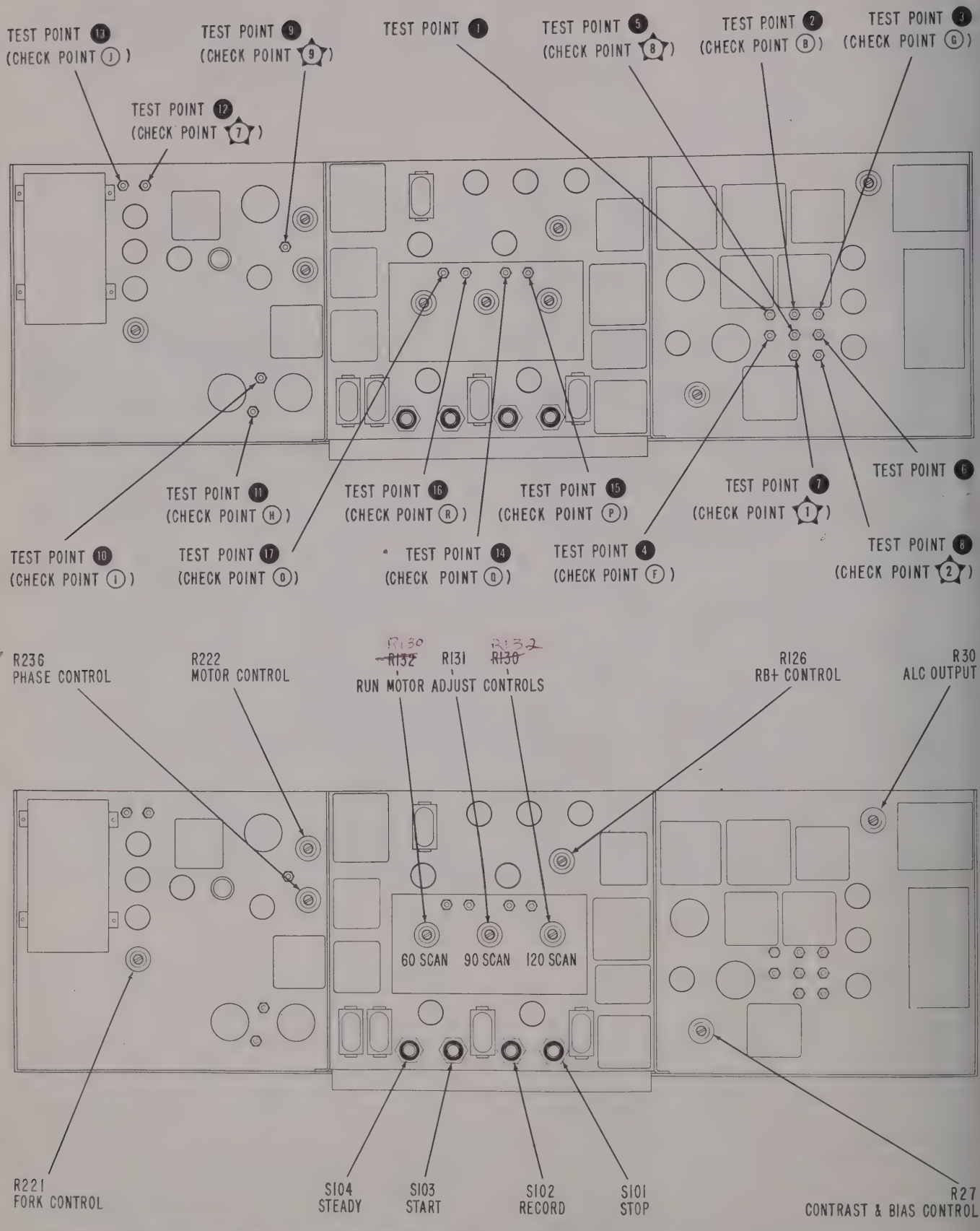

TEST POINT 13 (CHECK POINT J)
TEST POINT 9 (CHECK POINT 9)
TEST POINT 1
TEST POINT 5 (CHECK POINT 8)
TEST POINT 2 (CHECK POINT B)
TEST POINT 3 (CHECK POINT G)
TEST POINT 12 (CHECK POINT 7)
TEST POINT 11 (CHECK POINT H)
TEST POINT 16 (CHECK POINT R)
TEST POINT 15 (CHECK POINT P)
TEST POINT 7 (CHECK POINT 1)
TEST POINT 6
TEST POINT 10 (CHECK POINT I)
TEST POINT 17 (CHECK POINT O)
TEST POINT 14 (CHECK POINT Q)
TEST POINT 4 (CHECK POINT F)
TEST POINT 8 (CHECK POINT 2)
R236 PHASE CONTROL
R222 MOTOR CONTROL
R130
~~R132~~ R131 ~~R130~~
RUN MOTOR ADJUST CONTROLS
R132
R126 RB+ CONTROL
R30 ALC OUTPUT
60 SCAN
90 SCAN
120 SCAN
R221 FORK CONTROL
S104 STEADY
S103 START
S102 RECORD
S101 STOP
R27 CONTRAST & BIAS CONTROL

Figure 5–3. Recorder Set, Facsimile AN/UXH-2, Location of Test Points and Maintenance Controls

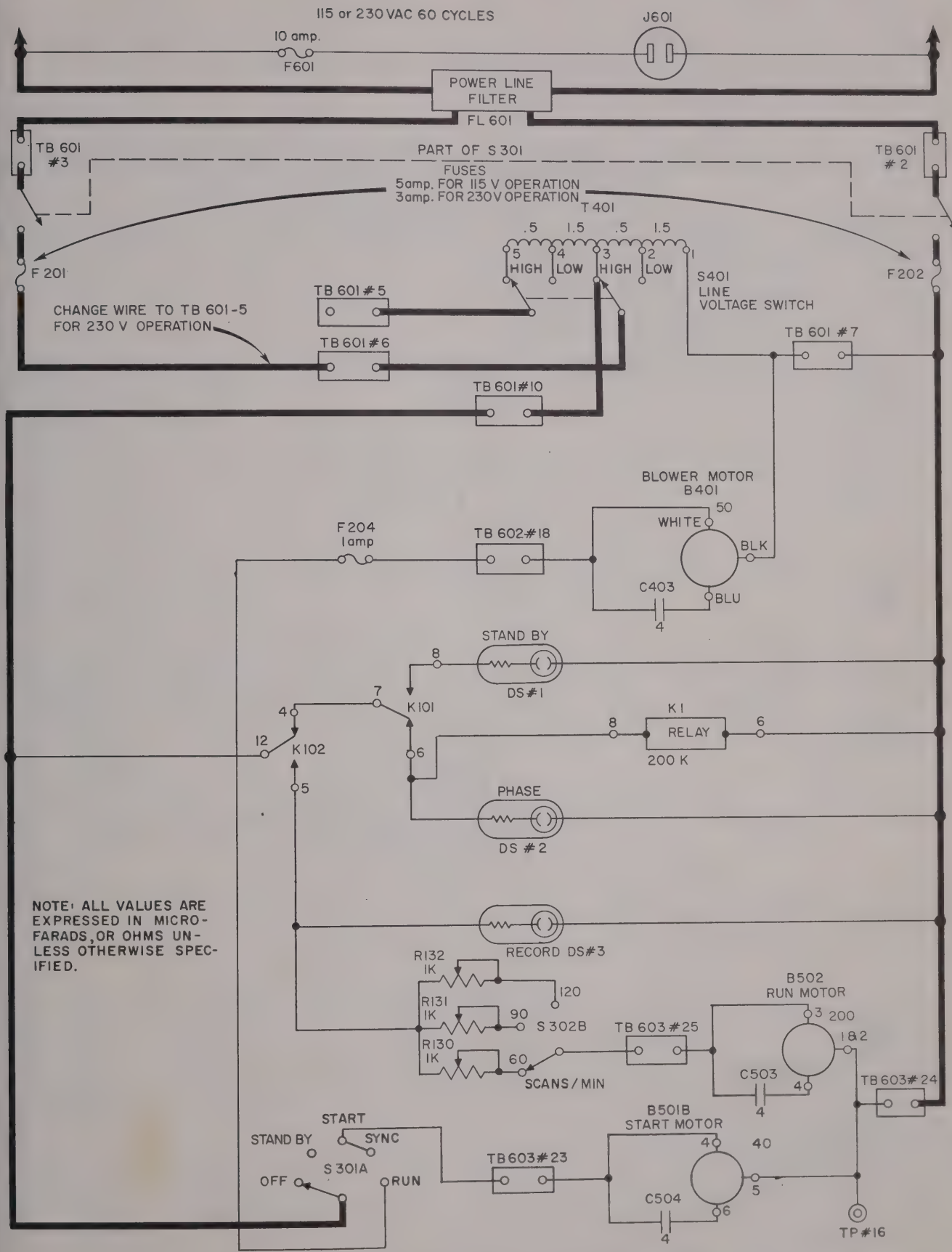


Figure 5–4. Recorder Set, Facsimile AN/UXH-2, Primary Power Distribution Schematic

TABLE 5–2. SIGNAL AMPLIFIER, AUTOMATIC LEVEL CONTROL AND PRINT AMPLIFIER CIRCUITS, FUNCTIONAL SYSTEM TROUBLE CHART

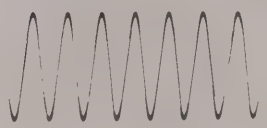
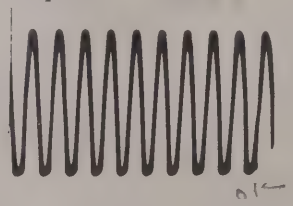
STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1		Attach a signal generator to the INPUT terminals and feed an 1800 cps signal at 0.1 VAC into the set. With the AUTO/MAN switch at AUTO, turn the equipment on up to RUN.		
2	Check points (5) and (6)	Connect an oscilloscope across the red and blue terminals of T301.	Wave shape shown below; signal strength 0.28 VAC peak to peak. 	If indication is normal, proceed to next step. If not, check for a faulty signal cable, T301, C601, C602, or C603.
3	Test point (6)	Connect a voltmeter between test points 6 and 5 (ground).	Meter should read —6 VDC.	If indication is normal, proceed to next step. If not, check for a defective T1, V1A, or associated components.
4	Check point (A)	Connect a voltmeter between the junction of CR1 and R8, and ground.	Meter should read —10 VDC.	Check for a defective V2, V1B, T2, or associated components.
5	Test point (2)	Connect an oscilloscope between test points 2 and 5 (ground).	Wave shape shown below; signal strength 400 VAC peak to peak. 	Check for a defective V4, T2, T3, or associated components.
6	Check point (C)	Connect a voltmeter between the orange or yellow terminals of T3 and ground.	Depending upon the setting of R27, the meter should read —27.5 VDC (R27 in max ccw position) to —62 VDC (R27 in max cw position).	Check for a defective T3, R27, V107 or associated components.
7	Test point (1)	Connect a voltmeter between test points 1 and 5 (ground).	Meter should read [illegible] VDC.	Check for a defective V5, V6, or associated components.
8	Check point (8)	Observe front panel meter.	Meter should read higher than 50.	Check for a defective M301, V5, V6, T3, or associated components.
9	Recording paper	Press RECORD test button and observe the recording.	Stylus needles should print a solid line across the paper.	Check for a defective T5 or a short in the trolley bar circuit.

TABLE 5–3. AUTOMATIC CONTROL CIRCUITS, FUNCTIONAL SYSTEM TROUBLE CHART

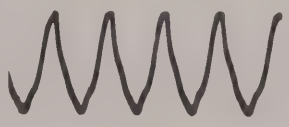
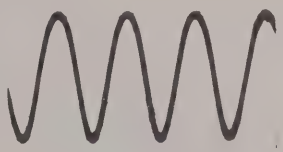
STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1		Attach a signal generator to the INPUT terminals and feed an 1800 cps signal at 0.1 VAC into the set. With the AUTO/MAN switch at AUTO, turn the equipment on up to RUN.		
2	Check point (D)	Connect an oscilloscope across CR104.	Wave shape shown below; signal strength 75 VAC peak to peak. 	If indication is normal, proceed to next step. If not, check for a defective FL103, CR104, V4B, or associated components.
3	Check point (E)	Connect an oscilloscope between V101 pin 4 and ground.	Wave shape shown below; signal strength 100 VAC peak to peak. 	Check for a defective FL102, V101A, K101, K102, or associated components.
4	Test point 4	Connect a voltmeter between test points 4 and 8 (RB+).	Meter should read 90 VAC.	Check for a defective V102B, K101, or associated components.
5	Test point 3	Connect a voltmeter between test points 3 and 8 (RB+).	Meter should read 98 VDC.	Check for a defective FL101, K102, V101B, V102A, or associated components.
6	Test point 12	Connect a voltmeter between test points 12 and 5 (ground). Interrupt the input signal momentarily to simulate a phasing pulse.	Wave shape shown below; signal strength 220 VDC peak to peak.	Check for a defective V205A, V204, DS202, or associated components.
7	Test point 15	Set SCANS/MIN switch at 60 and connect a voltmeter between test points 15 and 16.	Meter should read approx. 75 VAC; reading will vary, depending upon setting of R130.	
8	Test point 14	Set SCANS/MIN switch at 90 and connect a voltmeter between test points 14 and 16.	Meter should read approx. 70 VAC; reading will vary, depending upon setting of R131.	If any of the voltmeter readings differ from that specified in steps 7, 8 and 9, check the run motor, C503, S302, the appropriate potentiometer R130, R131 or R132, or associated components.
9	Test point 17	Set SCANS/MIN switch at 120 and connect a voltmeter between test points 17 and 16.	Meter should read approx. 80 VAC; reading will vary, depending upon setting of R132.	

TABLE 5–4. FORK OSCILLATOR AND MOTOR DRIVE CIRCUITS, FUNCTIONAL SYSTEM TROUBLE CHART

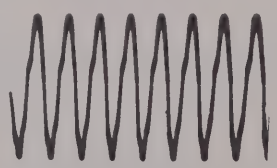
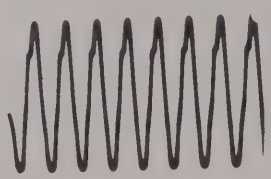
STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1		With the AUTO/MAN switch at AUTO, turn the equipment on up to RUN.		
2	Test point 13	Connect an oscilloscope between test points 13 and 5 (ground).	Wave shape shown below; signal strength 6 VAC peak to peak.	If indication is normal, proceed to next step. If not, check for a defective V201, V202, or associated components.
3	Test point 9	Connect an oscilloscope between test points 9 and 5 (ground).	Wave shape shown below; signal strength 22 VAC peak to peak. 	Check for a defective FL201, V203, V205B, or associated components.
4	Test points 10 and 11	Connect an oscilloscope between test points 10 and 5 (ground), and then between test points 11 and 5.	In each case, wave shape shown below; signal strength 22 VAC peak to peak. 	Check for a defective T201, V205, V206, or associated components.

TABLE 5–5. SPEAKER AMPLIFIER CIRCUIT, FUNCTIONAL SYSTEM TROUBLE CHART

STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1	Check point 10	Attach a signal generator to the INPUT terminals and feed an 1800 cps signal at 0.1 VAC into the set.	An 1800-cycle tone should be heard from the speaker; the volume of the tone should increase as R302 is rotated clockwise.	If no sound, check for a defective loudspeaker, T301, V3, T4, or associated components. If the volume doesn't change, check R302.

TABLE 5–6. TEST SIGNAL CIRCUIT, FUNCTIONAL SYSTEM TROUBLE CHART

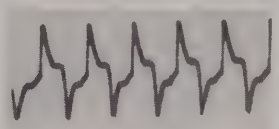
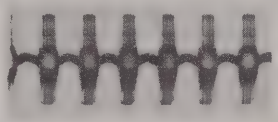
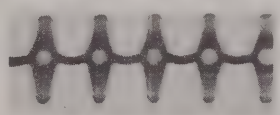
STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1		Connect an oscilloscope across R104 and turn the equipment on up to RUN.		
2	Check point (K)	Press STEADY test button S104.	Wave shape shown below; signal strength 7 VAC peak to peak. 	
3	Check point (L)	Press START test button S103.	Wave shape shown below; signal strength 7 VAC peak to peak. 	300 CPS If any of the wave shapes differ from those shown, check T101, V103, FL104, the appropriate switches S101, S102, S103 or S104, or associated components.
4	Check point (M)	Press RECORD test button S102.	Wave shape shown below; signal strength 7 VAC peak to peak. 	60 CPS
5	Check point (N)	Press STOP test button S101.	Wave shape shown below; signal strength 7 VAC peak to peak.	450 CPS

TABLE 5–7. POWER SUPPLY CIRCUIT, FUNCTIONAL SYSTEM TROUBLE CHART

STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1		Turn equipment on up to STAND BY.		
2	Check points (3) and (4)	Connect a voltmeter across pins 6 and 7 of TB601.	Meter should read 115 VAC (or voltage of power line).	If indication is normal, proceed to next step. If not, check for a defective FL601, F201 or F202.
3	Test point (7)	Connect a voltmeter between test points 7 and 5 (ground).	Meter should read 400 VDC.	Check T401, L401, or associated components.
4	Test point (8)	Connect a voltmeter between test points 8 and 5 (ground).	Meter should read 225 VDC.	Check V105, V106, V107, or associated components. Check the setting of R126.

TABLE 5–8. SYNC SYSTEM, FUNCTIONAL SYSTEM TROUBLE CHART.

STEP	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1	Check phase actuator as described in step 3, Table 5–1.	When STEADY button is pressed, released armature should catch sync clutch stop arm. Armature should pull back and permit sync shaft to rotate when STEADY button momentarily released.	Do nothing unless recorded copy is out of phase. Check test point no. 12 for a voltage kick on each phasing pulse (1000 volt scale DC). Check the armature action and position (par. 6.3–4*j*). Check electrical connections to phase actuator (par. 6.3–4*j*(3)). If both O.K., replace phase actuator (par. 6.3–*j*(3)).
2	Examine recorded copy from a transmission.	Copy should be legible, centered and square. See fig. 5–1.	If stylus band moves faster than normal (copy appears as in fig. 5–1E) check dog latch spring (par. 6.3–4*i*(7). Check sync motor coils (par. 6.3–4*m*). If copy is not correctly phased, check for phasing pulse from phasing thyratron cathode, test pin no. 12. Next check the phase actuator (par. 6.3–4*j*) and the flywheel and sync clutch pawl tensions (par. 6.3–4*k*, *l*). If sync motor drops out of sync when the run motor starts, check the flywheel ratchet, hub & gear ass'y and 116-T helical gear (par. 6.3–4*i*). If recorded transmission is completely out of synchronism (fig. 5–1A), check sync motor (par. 6.3–4*m*) and sync gears (par. 6.3–4*i*). If there is slight skew in either direction (fig. 5–1E), check recorder frequency per par. 6.3–2*e*, or determine whether facsimile transmitter is on frequency. If there is quite a bit of skew (fig. 5–1F), check sync and run mechanisms and paper feed system (Table 5–11).

TABLE 5–9. RUN SYSTEM, FUNCTIONAL SYSTEM TROUBLE CHART.

STEP	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1	Examine recorded copy from a transmission.	Copy should appear as in fig. 5–1.	If run motor doesn't start when RECORD button is pressed, check electrical connections to and operation of run motor (par. 6.3–4*b*). Check capacitor C503. If run motor starts but wheels and band do not turn, check the adjustment of the run slip clutch (par. 6.3–4*g*). If the sync motor drops out of sync speed when the run system starts, or the sync motor runs above sync speed, check the run slip clutch (par. 6.3–4*g*). If there is a great deal of skew (more than about ½ inch per foot of copy), check the run motor or run motor gears (par. 6.3–4*b*).

TABLE 5–10. BAND & STYLUS ASSEMBLY, FUNCTIONAL SYSTEM TROUBLE CHART.

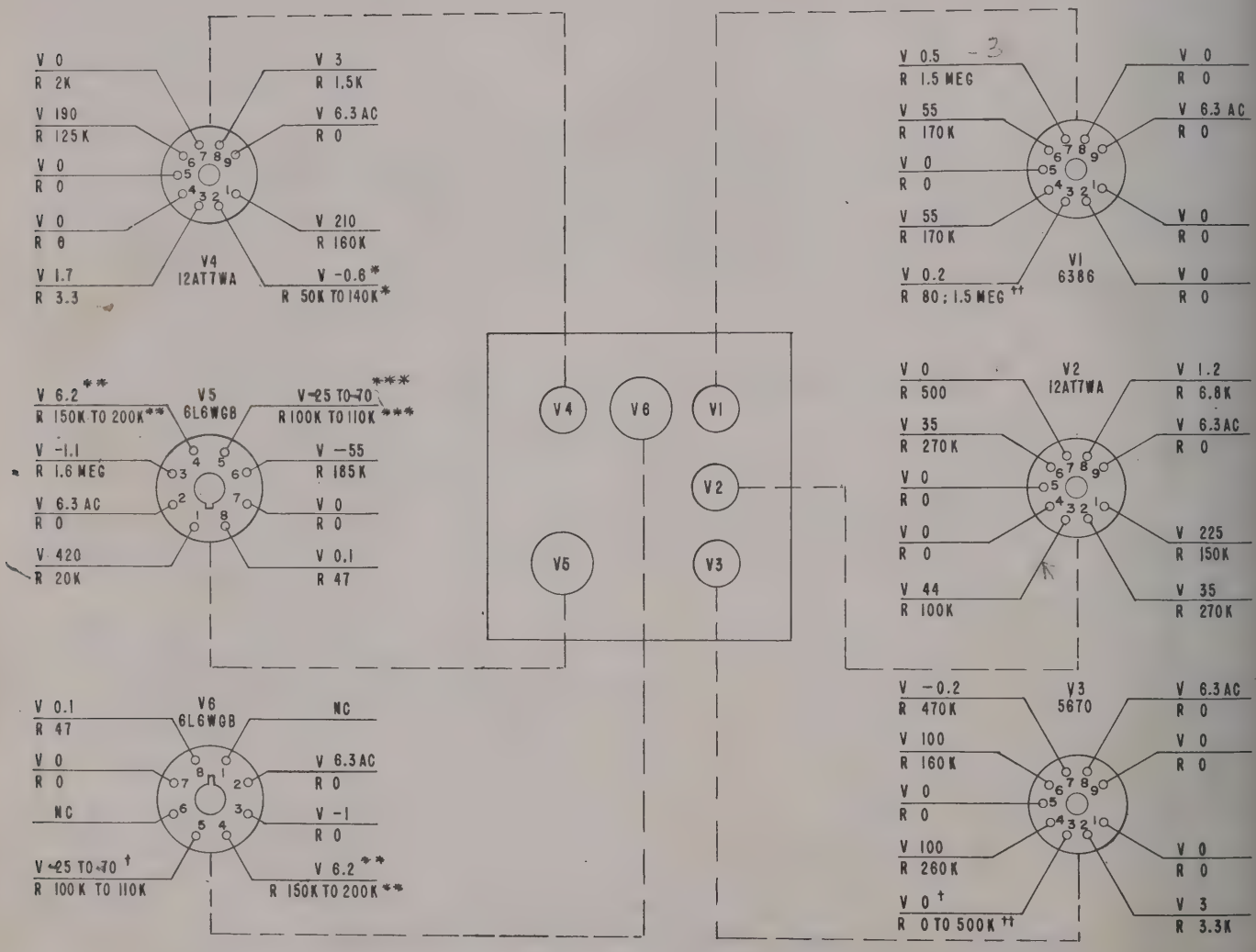
STEP	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1	Examine recorded copy from a transmission.	Copy should appear as in fig. 5–1.	If band moves but stylus needles do not print, or if the recording has white streaks or gaps, check that the stylus needles are long enough to contact the paper, and that the stylus bushings are touching the trolley bar. If necessary, change the needles (par. 3–6*a*) or rotate bushings (par. 6.3–4*b*(2)). Check stylus pressure springs (par. 6 3–4*b*(1)). Check electrical connection to trolley bar and trolley bar position (par. 6.3–4*d*). If there is line grouping, check the trolley bar alignment (par. 6.3–4*d*) and the stylus holder assemblies (par. 6.3–4*b*). Also check deflector plate position (par. 6.3–4*e*). If the stylus band moves faster than normal, the lugs may be slipping by the sync arm. Change the band (par. 3–6*d*). If there is jitter in a repetitive pattern, check that the stylus needles are straight (par. 3–6*f*) and that the stylus holder assemblies are properly aligned (par. 3–6*e*). If the copy is not correctly phased, check that the band is not indexed on a wrong lug (par. 3–6*d*). If so, remove band and replace.

TABLE 5–11. PAPER FEED SYSTEM, FUNCTIONAL SYSTEM TROUBLE CHART.

STEP	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1	Examine recorded copy from a transmission.	Copy should appear as in fig. 5–1.	If the band moves but the paper does not feed properly (horizontal lines only), check that the PAPER FEED lever is in OPERATE position. Check the paper drag clutch tension (par. 6.3–4*s*). Check that the shear pin has not been broken (par. 6.3–4*n*). If there is line grouping due to erratic paper feed, check the pressure roll assemblies (par. 6.3–4*p*, *t*), the paper drag clutch tension (par. 6.3–4*s*) or binding in the paper feed gears (par. 6.3–4*n*).

c. VOLTAGE AND RESISTANCE MEASUREMENTS.—Figures 5—5 through 5—8 show the relative locations of the tube sockets (from the wiring side), with the voltage and resistance values from each terminal to ground, unless otherwise noted.

The voltage measurements are all DC unless otherwise noted. The AC power to the equipment should be turned off for all resistance measurements. The meters used are specified in paragraph 5.2—2.



NOTES
FOR RESISTANCE MEASUREMENTS, UNIT DISCONNECTED FROM POWER SOURCE.
FOR VOLTAGE MEASUREMENTS, UNLESS OTHERWISE SPECIFIED, UNIT CONNECTED TO 115 V 60 CPS POWER SOURCE, WITH NO INPUT SIGNAL, SELECTOR SWITCH AT RUN, SCANS/MIN SWITCH AT 60, AUTO/MAN SWITCH AT AUTO, GAIN CONTROL AT AUTO, LINE VOLTAGE SWITCH AT LOW.
READINGS TAKEN WITH A MULTIMETER SIMILAR TO MULTIMETER AN/USM-31.

KEY TO SYMBOLS

AC	INDICATES AC VOLTAGE TO GROUND UNLESS OTHERWISE INDICATED.
K	INDICATES 1,000 OHMS.
MEG	INDICATES MEGOHMS.
NC	INDICATES NO CONNECTION.
R	INDICATES OHMS OF DC RESISTANCE WITH EXTERNAL CABLES DISCONNECTED.
V	INDICATES DC VOLTAGE TO GROUND UNLESS OTHERWISE INDICATED.
*	DEPENDING UPON THE SETTING OF CONTRAST CONTROL R27 AND ALC OUTPUT CONTROL R30.
**	DEPENDING UPON THE SETTING OF DENSITY CONTROL R303.
†	DEPENDING UPON THE SETTING OF CONTRAST CONTROL R27.
††	DEPENDING UPON THE SETTING OF SPKR VOLUME CONTROL R302.

Figure 5—5. Resistance and Voltage Measurements, Signal Amplifier, Print, ALC and Speaker Amplifier Circuits

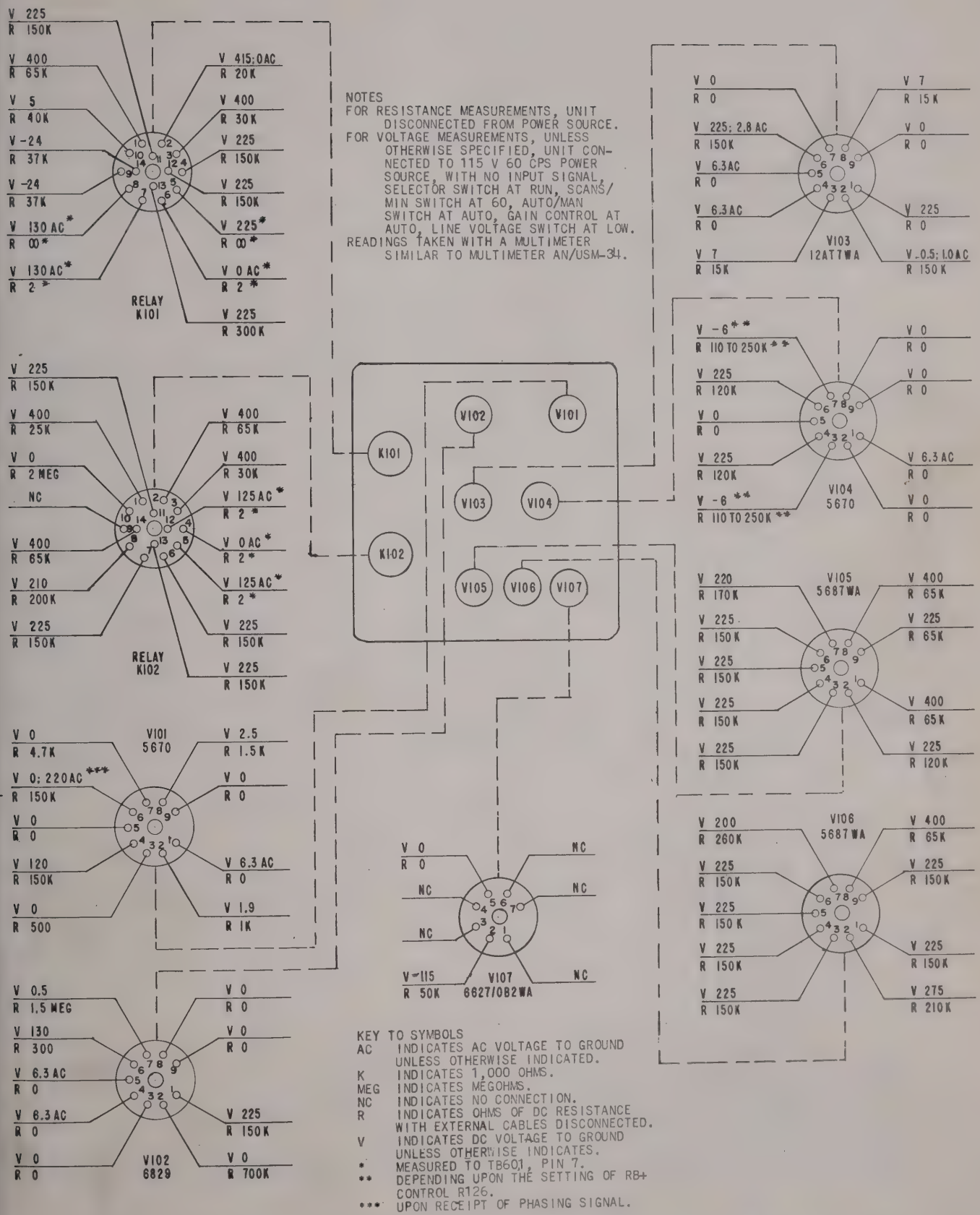
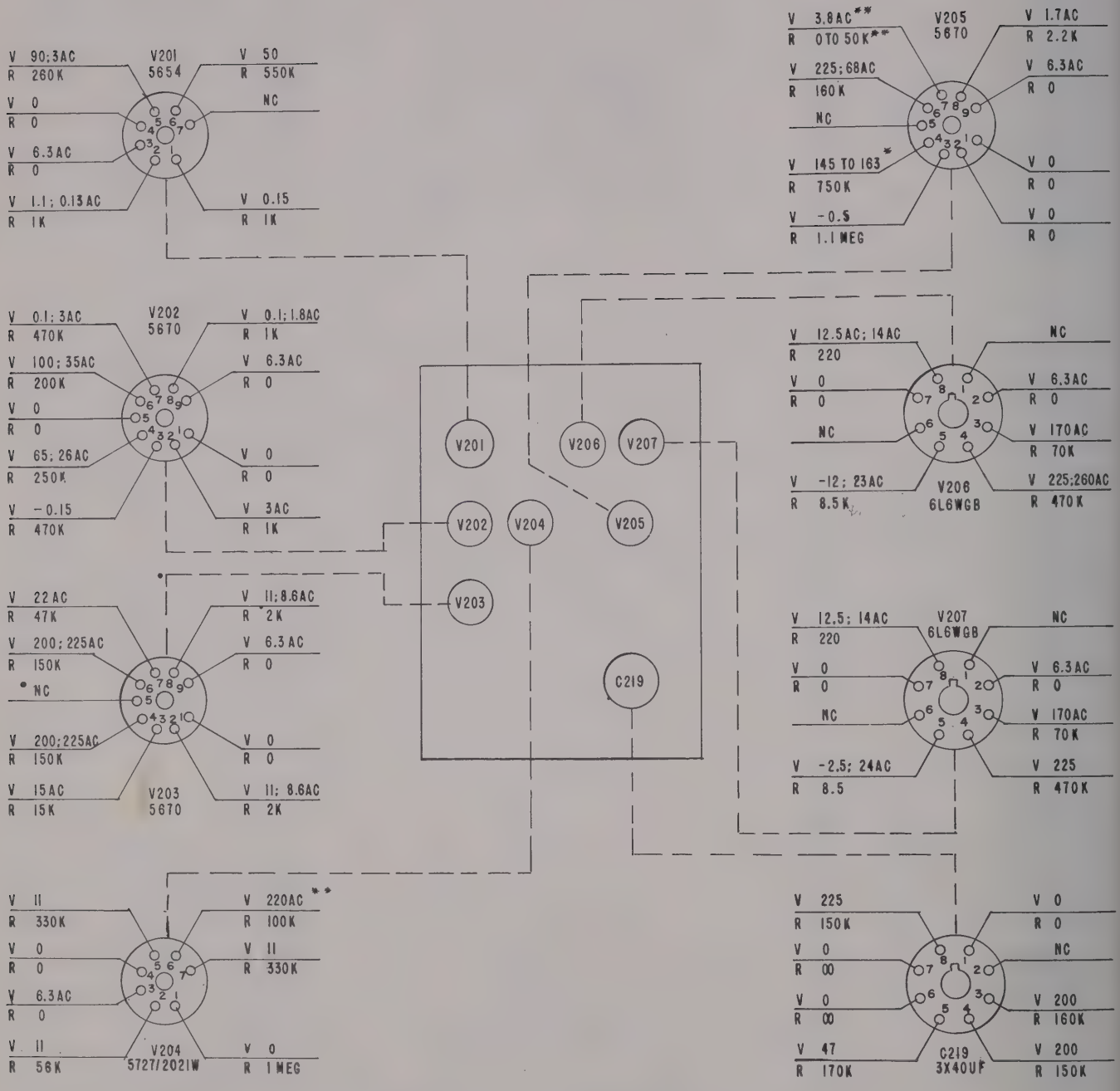

NOTES
FOR RESISTANCE MEASUREMENTS, UNIT DISCONNECTED FROM POWER SOURCE.
FOR VOLTAGE MEASUREMENTS, UNLESS OTHERWISE SPECIFIED, UNIT CONNECTED TO 115 V 60 CPS POWER SOURCE, WITH NO INPUT SIGNAL, SELECTOR SWITCH AT RUN, SCANS/MIN SWITCH AT 60, AUTO/MAN SWITCH AT AUTO, GAIN CONTROL AT AUTO, LINE VOLTAGE SWITCH AT LOW.
READINGS TAKEN WITH A MULTIMETER SIMILAR TO MULTIMETER AN/USM-34.
RELAY K101
RELAY K102
V101 5670
V102 6829
V103 12AT7WA
V104 5670
V105 5687WA
V106 5687WA
V107 6627/0B2WA
K101
K102
KEY TO SYMBOLS
AC INDICATES AC VOLTAGE TO GROUND UNLESS OTHERWISE INDICATED.
K INDICATES 1,000 OHMS.
MEG INDICATES MEGOHMS.
NC INDICATES NO CONNECTION.
R INDICATES OHMS OF DC RESISTANCE WITH EXTERNAL CABLES DISCONNECTED.
V INDICATES DC VOLTAGE TO GROUND UNLESS OTHERWISE INDICATES.
* MEASURED TO TB601, PIN 7.
** DEPENDING UPON THE SETTING OF RB+ CONTROL R126.
*** UPON RECEIPT OF PHASING SIGNAL.

Figure 5–6. Resistance and Voltage Measurements, Automatic Control and RB+ Circuits



NOTES
FOR RESISTANCE MEASUREMENTS, UNIT DISCONNECTED FROM POWER SOURCE.
FOR VOLTAGE MEASUREMENTS, UNLESS OTHERWISE SPECIFIED, UNIT CONNECTED TO 115 V 60 CPS POWER SOURCE, WITH NO INPUT SIGNAL, SELECTOR SWITCH AT RUN, SCANS/MIN SWITCH AT 60, AUTO/MAN SWITCH AT AUTO, GAIN CONTROL AT AUTO, LINE VOLTAGE SWITCH AT LOW.
READINGS TAKEN WITH A MULTIMETER SIMILAR TO MULTIMETER AN/USM-34.

KEY TO SYMBOLS
AC INDICATES AC VOLTAGE TO GROUND UNLESS OTHERWISE INDICATED.
K INDICATES 1,000 OHMS.
MEG INDICATES MEGOHMS.
NC INDICATES NO CONNECTION.
R INDICATES OHMS OF DC RESISTANCE WITH EXTERNAL CABLES DISCONNECTED.
V INDICATES DC VOLTAGE TO GROUND UNLESS OTHERWISE INDICATED.
* DEPENDING UPON THE SETTING OF PHASE ADJUST CONTROL R236.
** UPON RECEIPT OF A PHASING PULSE.

Figure 5–7. Resistance and Voltage Measurements, Fork and Motor Drive Circuit

T401
5 2.4* 9 25 13 0
4 2.0* 8 10 12 0
3 1.0* 7 0
2 0.8* 6 25 11 0
1 0 10 0
L401
30K 30K
C403
40 40
C402
0 30K
C401
30K 0
C404
NC
NC
NC
NC
NC
NC
100K
KEY TO SYMBOLS
K INDICATES 1,000 OHMS
NC INDICATES NO CONNECTION
* MEASUREMENTS MADE TO PIN 1
NOTES
NO VOLTAGE MEASUREMENTS ARE SHOWN FOR THE POWER SUPPLY CIRCUIT BECAUSE THE POWER SUPPLY CHASSIS MUST BE REMOVED FROM THE CABINET TO PERMIT ACCESS TO THE SOCKETS AND TERMINALS.
RESISTANCE MEASUREMENTS ARE OHMS OF DC RESISTANCE. MEASUREMENTS ARE TAKEN WITH THE UNIT DISCONNECTED FROM THE POWER SOURCE AND EXTERNAL CABLES UNATTACHED.

Figure 5–8. Resistance and Voltage Measurements, Power Supply

5–5. TYPICAL TROUBLES.

The following chart gives symptoms of typical troubles in the order of expected frequency.

TABLE 5–12. RECORDER SET, FACSIMILE AN/UXH-2, TYPICAL TROUBLES.

TROUBLE	NATURE OF TROUBLE	SYMPTOMS
No power to equipment.	One or both line fuses blown. Line cord not properly installed.	POWER ON indicator does not glow when set turned on.
Poor quality recording.	Excessive drop in signal level. Low density markings on original. Weak signal or print amplifier tubes V1, V2, V5, or V6. CONTRAST, DENSITY or ALC OUTPUT controls improperly adjusted. Stylus needles worn out. Trolley bar or stylus bushings dirty.	Light recording.
	Stylus bushings dirty. One stylus not printing. Trolley bar dirty. Stylus bushings worn unequally. Misaligned trolley bar. Bent stylus. Damaged stylus leaf spring. Paper feed drag clutch improperly adjusted. PAPER FEED LEVER not fully seated in OPERATE position. Pressure roller cam shaft ass'y improperly adjusted. Run slip clutch too loose. Paper feed clutch pawl not slipping over ratchet properly. Binding in paper feed gears.	Line grouping.
	Bent stylus needles (deflector plate may be in wrong position). Run motor voltage too low (jitter on the left). Stylus holder out of alignment. Band lug bent out of position.	Jitter in a repetitive pattern in copy.
	Stylus needle missing or worn too short. Trolley bar not correctly positioned so that bushing not making contact on portions of trolley bar. Damaged stylus leaf spring.	Portions or all of one scan line missing.
	CONTRAST control set too low. Transmitter contrast low. Extraneous signal or compression in transmission circuit. Extraneous signal pick-up or compression in recorder amplifier.	Background prints a light gray.
	Transmitter drum not feeding properly.	Recording is group of vertical lines.
	PAPER FEED LEVER not in OPERATE position. Shear pin in paper feed clutch broken. Rubber pressure rollers not seated properly. Pressure roller cam shaft assembly may be out of adjustment.	Horizontal streaks across copy.

TABLE 5—12. RECORDER SET, FACSIMILE AN/UXH-2, TYPICAL TROUBLES (Cont)

TROUBLE	NATURE OF TROUBLE	SYMPTOMS
Out of synchronism.	Fork of either transmitter or recorder not oscillating at proper frequency. Read para. 6.3—2*e* before adjusting FORK CONTROL. Do not try to set fork at 3600 cps since it should be set to 3600.000 ± .001 cps and an exceptionally good frequency standard is required. Silicon diode CR201 defective.	Slight skew in either direction.
Out of phase.	Not enough phasing pulses received. Transmitter knocked out of phase when recording started. Band indexed on wrong lug or has slipped a lug (edge of recorded copy is in center.) Sync motor knocked ahead when recording started. *a.* See step 1 of table 5—8. *b.* Run motor voltage may be too high. *c.* Sync motor voltage may be too low. *d.* Decoupled flywheel not working due to broken coupling pin or pawl. Relay K1 or K102 defective. Phase actuator out of adjustment or defective. V204, V205, or DS201 defective. Sync clutch pawl spring weak. Dog latch loose on shaft (slipping).	Recorded copy not centered.
Recorded contrast too high.	CONTRAST CONTROL set improperly. Signal from transmitter has too high contrast.	Light portions of original copy missing.
Frequency divider not locked as submultiple of fork frequency.	Tube V203 defective. Filter FL201 defective. RB+ voltage outside of limits. Fork oscillator not functioning. Insufficient locking voltage at pin 3 of V203.	Large skew in recorded copy or unintelligible copy.
Paper feed system not operating properly.	Pressure rollers not seated properly. Check pressure roller cam shaft assembly adjustment. Paper feed clutch pawl not engaging ratchet properly or shear pin in paper feed clutch broken. Paper drag clutch improperly adjusted. Run slip clutch too loose. Paper guide fingers bent.	Erratic paper movement.
Accumulated recorded paper impeding free movement of paper from equipment.	Machine run for more than an hour without tearing off recorded copy or allowing recorded paper to fall to the floor behind or in front of equipment.	Recorded paper jams inside recorder.
No sync motor drive power.	V205, V203, V206 or V207 defective. B+ fuse blown. Defective sync motor.	Sync motor tone not heard.
Faulty sync motor drive power.	V205, V206 or 207 defective. MOTOR CONTROL improperly adjusted. Flywheel assembly not functioning properly. Run slip clutch improperly adjusted.	Sync motor drops out of sync when band catches up with sync drive system.

TABLE 5–12. RECORDER SET, FACSIMILE AN/UXH-2, TYPICAL TROUBLES (Cont)

TROUBLE	NATURE OF TROUBLE	SYMPTOMS
	V205, V206, or V207 defective. Defective bearing in sync system. MOTOR CONTROL improperly adjusted. Fork amplifier or frequency divider defective. Low B+ or B+ fuse blown.	Sync motor does not fall into sync.
	Sync motor defective.	Start motor does not bring sync motor up to sync speed.
No print power.	Trolley bar shorted to ground or wire to trolley bar broken or not securely connected. Defective T5.	Band moves but stylus needles do not print although front panel meter indicates incoming signal.
	V1, V2, V4, V5 or V6 defective.	Band moves, stylus needles do not print, loudspeaker indicates a signal but meter doesn't on signal from facsimile transmitter or when STEADY button S104 pressed.
	No facsimile signals coming in. Faulty transmission channel. Signal leads disconnected from recorder.	Band moves, stylus needles do not print, and neither loundspeaker nor meter indicate a signal.
Stylus band not driven properly.	Mechanical interference such as frozen bearings, jammed gears, jamed paper, etc. Relay K101 or K102 defective. Filter FL201 defective. Run slip clutch improperly adjusted. Run motor defective.	Wheels and band do not turn when set turned to RUN and RECORD button pressed, or start record signal received.
	Run slip clutch too loose. Excessive loading on run system. Defective FL201.	Band running too slow.
	Band lugs slipping by sync arm. Replace band assembly. Dog latch spring broken or dog latch stuck. FL201 defective. Sync clutch pawl spring broken.	Band moves faster than normal.
Control circuits not functioning properly.	Stop control tone not received or not high enough contrast. CR104 defective. V102 defective. Relay K101 or K102 defective Filter FL102 defective.	Recorder doesn't stop between recordings.
	Start control tone not received or not high enough contrast. Relay K101 or K102 defective. CR102 or CR104 defective. Filter FL102 defective.	Recorder doesn't change from standby when start signal is received.
	Start record signal tone not received or not high enough contrast. CR101 or CR104 defective. V102 defective. Relay K101 or K102 defective. FL101 defective.	Recorder does not start recording when start record tone is received.

5–6. LOCATION OF PARTS.

The wiring diagrams, figures 6–25 through 6–31, show the location of electrical components. The tubes are also located in figure 3–8, and the power supply components in figures 5–9 and 5–10.

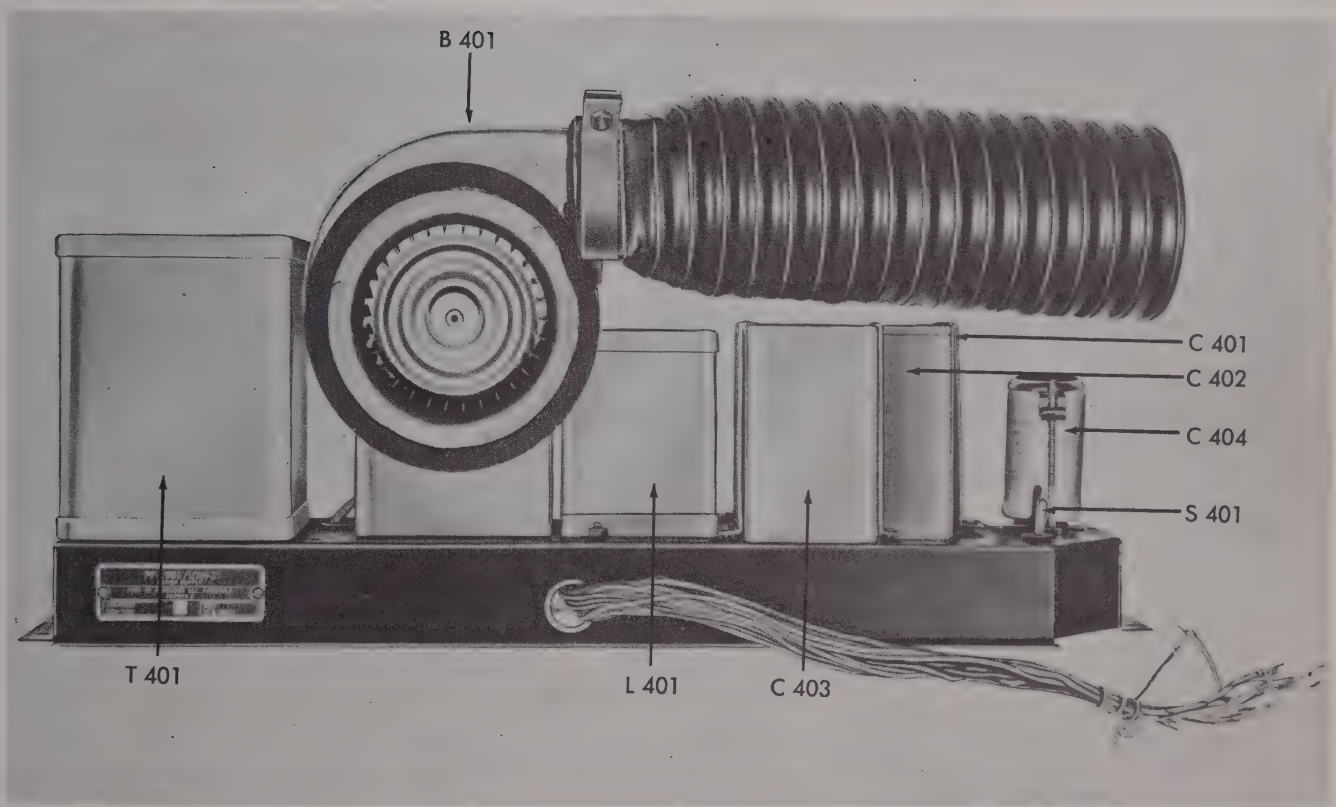


Figure 5–9. Power Supply PP-1901/UXH-2, Top View, Parts Location

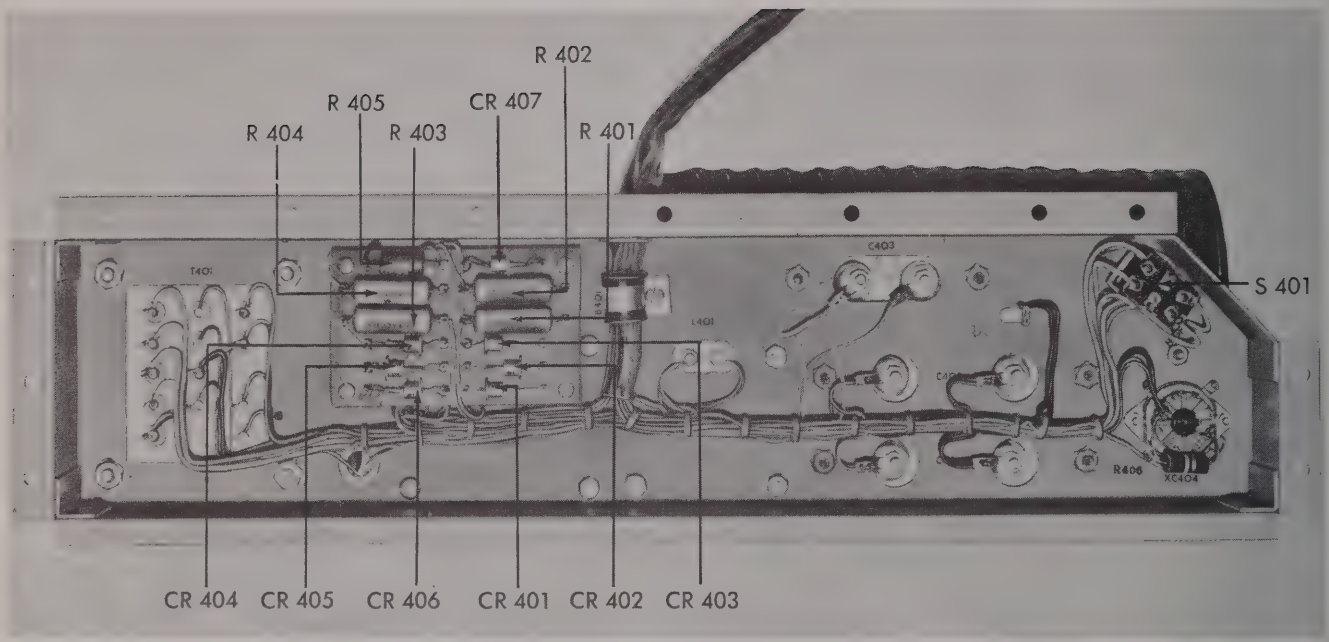


Figure 5—10. Power Supply PP-1901/UXH-2, Bottom View, Parts Location

SECTION 6
SERVICE AND REPAIR

SUB-SECTION 6.1 PREVENTIVE MAINTENANCE

6.1–1. INTRODUCTION.

To prevent equipment failure and impairment of the operating efficiency of this facsimile set, the checks and procedures described in this sub-section should be performed regularly as directed.

Making unnecessary inspection at frequent intervals of items not specified in these tables may lead to a lower equipment performance reliability due to replacement of a partly worn item which has passed a possibly high initial failure rate with a new one which has not. It is also possible to break or misalign parts during inspection. An equipment which is giving proper performance is generally more reliable before than after inspection. Do not make an inspection of an item where you are not sure of what you are doing.

This sub-section contains daily, weekly, monthly, quarterly, and semi-annual steps, some of which are routine and others technical. To lighten the load of the technician, the routine steps should be made by operating personnel. The periodic requirements are not fixed standards, and may be changed due to variations in transmission traffic and general use of the machine. The intervals quoted here are averages established by many technicians of varied experience, and are based on normal use of the equipment in temperate climates. If the equipment is used in tropical climates or in an excessively dusty or sandy atmosphere, it should be cleaned and lubricated more frequently.

6.1–2. TEST EQUIPMENT NECESSARY.

The two alignment fixtures (M601 and M602) mentioned in the maintenance schedule are in the tool box under the cabinet hood, along with three retainer ring pliers (H601, H602 and H603), five Allen-type keys (H604 through H608), and a screwdriver (H609).

Other tools necessary for disassembly are mentioned in paragraph 6.3-4.

Lint-free cloths, a nylon-bristled brush, and Toluene or an equivalent solvent should be available.

The following aids are also needed to properly maintain the equipment. A six-inch scale is useful in determining the amount of unused recording paper left on the roll. A multimeter similar to AN/USM-34 is necessary to read line voltages. Meters required to check the alignment controls are mentioned in paragraph 6.3–2. A compatible transmitter (see paragraph 1–3) is required to record actual copy.

Using a vacuum cleaner or similar suction device is the preferred method of cleaning the equipment. For lubrication, a brush similar to SNSN 38-B-4480 and an oil can similar to SNSN 36-C-520 should be used.

6.1–3. ADJUSTMENTS NECESSARY.

TABLE 6–1. ADJUSTMENTS NECESSARY

ADJUSTMENT OF	PARAGRAPH IN SECTION 6.3
R27 – CONSTAST CONTROL	2*f*
R30 – ALC OUTPUT	2*i*
R126 – RB+ CONTROL RUN MOTOR ADJUST CONTROLS	2*b*
R130 – 60 SCANS	2*b*
R131 – 90 SCANS	2*c*
R132 – 120 SCANS	2*d*
R221 – FORK CONTROL	2*e*
R222 – MOTOR CONTROL	2*a*
R236 – PHASE CONTROL	2*g*

6.1–4. MAINTENANCE TEST PROCEDURES AND REFERENCE STANDARDS.

Tables 6–2 through 6–6 list the items which should be checked daily, weekly, monthly, quarterly and semi-annually, to ensure optimum operation of the equipment.

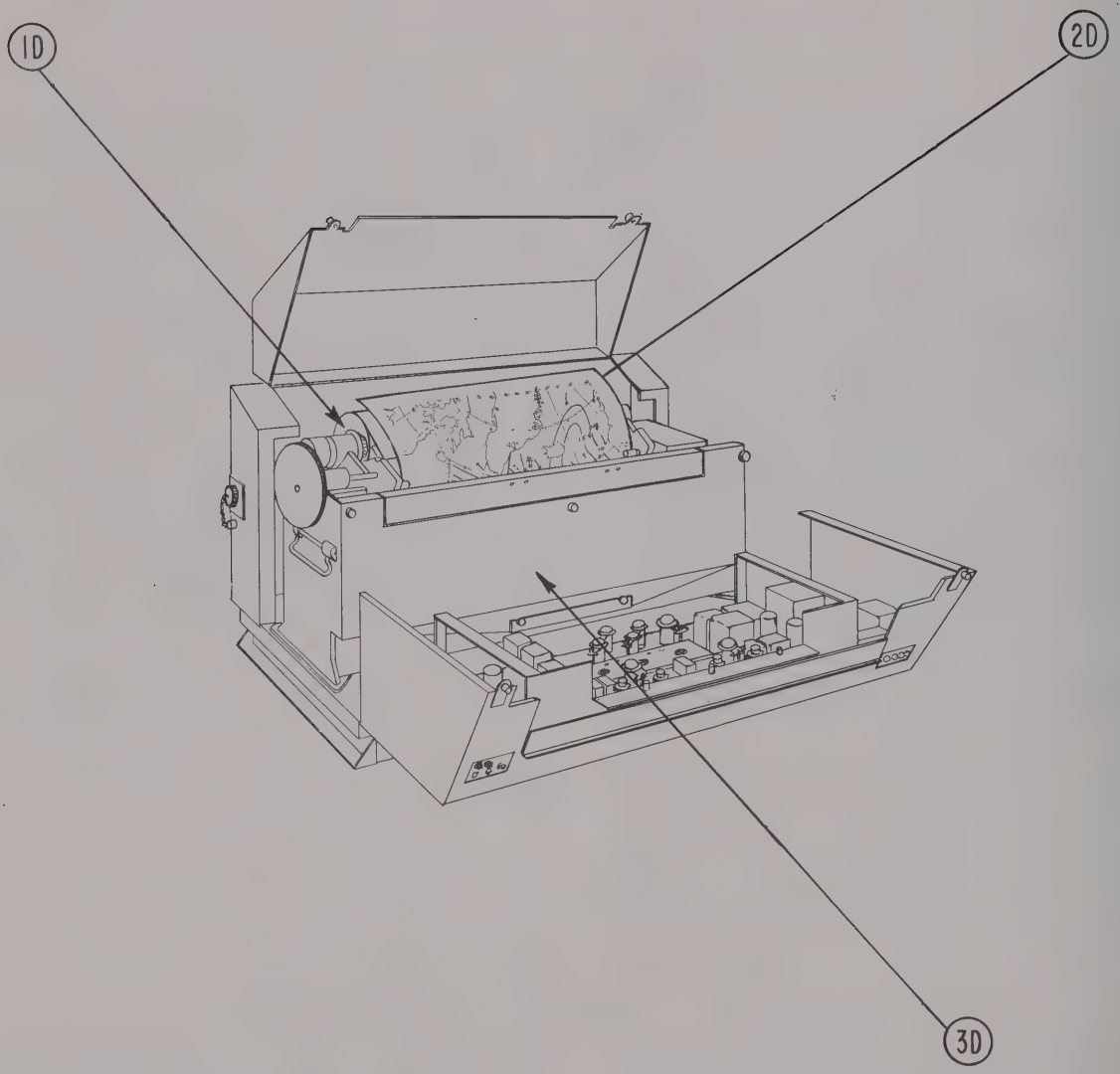

1D
2D
3D

TABLE 6–2. DAILY MAINTENANCE SCHEDULE

Recorder Set, Facsimile AN/UXH-2
completely deenergized.

STEP NO.	ACTION REQUIRED	PROCEDURE
1D	Keep ample recording paper in equipment.	Determine if sufficient paper remains for 24-hour operation by measuring the distance from the core to the outside of the unused recording paper roll. A 9/16-inch roll will last for 24 hours at 60 scans, ¾-inch roll will last for 24 hours at 90 scans, and ⅞-inch roll will last for 24 hours at 120 scans.
2D	Examine quality of recording for jitter, streaks, line grouping, etc.	Copy should have appearance similar to fig. 5–1. If defects are apparent, refer to table 5–12 for probable causes of trouble.
3D	General mechanical inspection.	Visually inspect equipment for any loose fittings, loose mounting nuts and screws, or any excessive play in controls and switches. Check for signs of rust and corrosion, accumulated dust or grease. If necessary to remove any excess accumulation of dust or grease, clean with a cloth dampened with cleaning solvent.

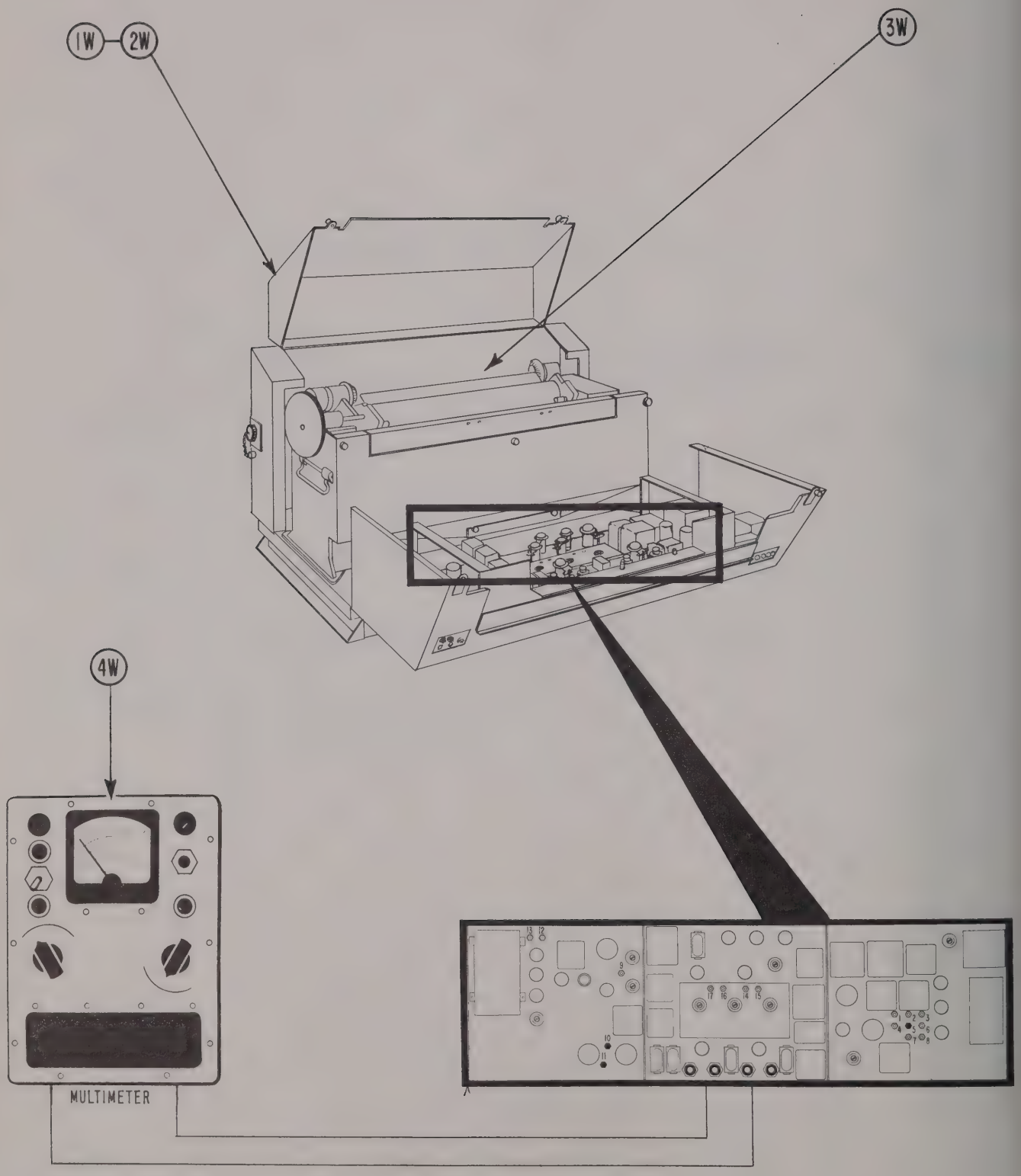
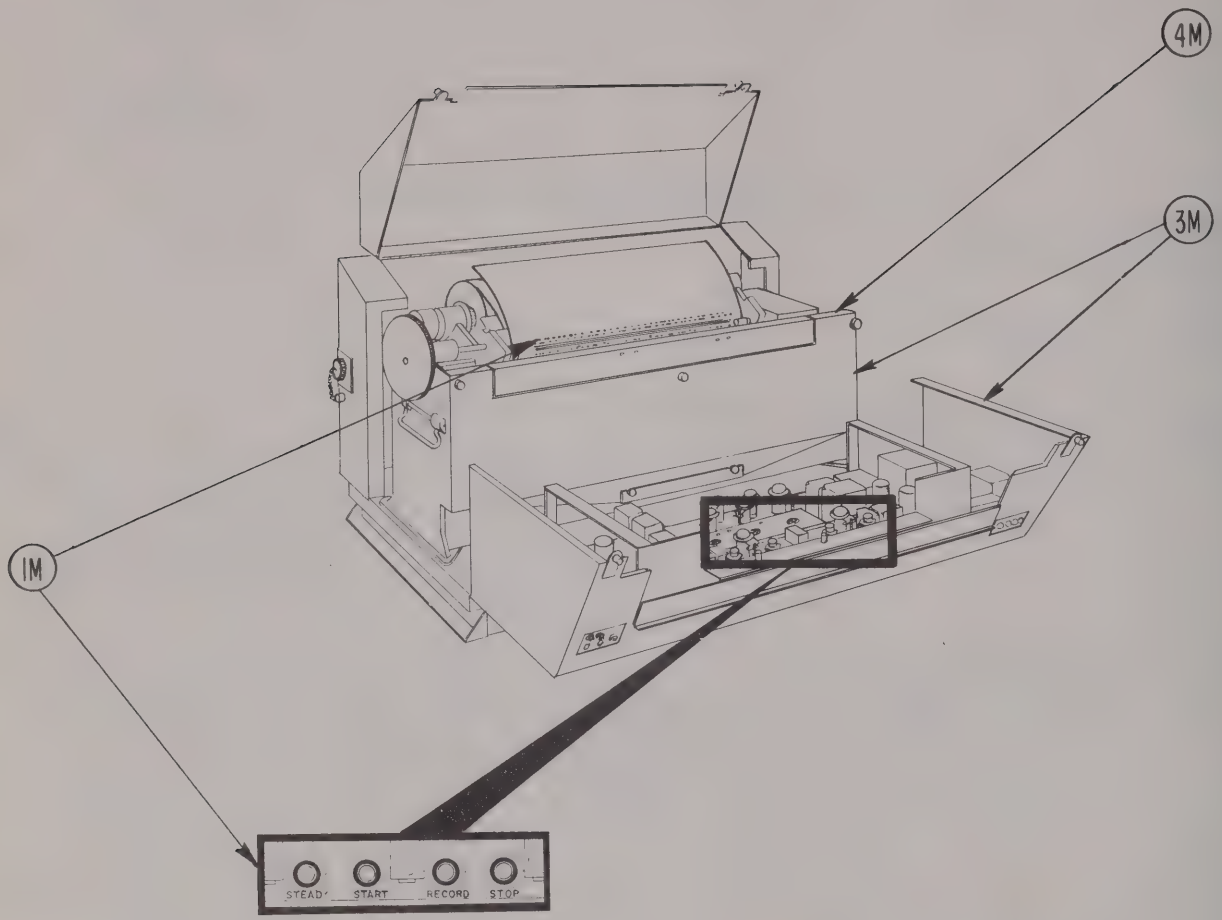

1W
2W
3W
4W
MULTIMETER

TABLE 6–3. WEEKLY MAINTENANCE SCHEDULE

Recorder Set, Facsimile AN/UXH-2
completely deenergized for steps
1W through 3W.
AUTO/MAN switch and GAIN control
both at AUTO for step 4W.

STEP NO.	ACTION REQUIRED	PROCEDURE
1W	Inspection of all electrical and mechanical components.	Inspect the terminals of all capacitors, resistors, filters and transformers for corrosion and loose connections. Tighten all mounting screws, nuts and brackets. Inspect all tubes to make certain they are firm in their sockets. Tubes with loose envelopes should be replaced. Check all remaining electrical components.
2W	Clean electrical chassis, mech unit and inside of cabinet.	Open cabinet and remove any excess accumulation of dust or grease with a vacuum cleaner and a cloth dampened with cleaning solvent. Open mech unit cover and remove band. Carefully brush dirt from front of mech unit, wheels, and inside of mech unit cover into tray. Empty tray and replace. Clean trolley bar, band and bushings with a cloth dampened with cleaning solvent. Be careful not to damage stylus assemblies. Replace band and close mech unit.
3W	Inspect exhaust system.	See that dust has not accumulated to prevent free air flow through the hose. Examine hose for cracks.
4W	Record sync motor voltage.	Open equipment. Set a multimeter similar to ME-25/U or AN/USM-34 series to the 25 vac scale and connect the negative side of TP No. 5 (B-) and the positive side to TP No. 10 (V207 cathode). Turn S301 up to RUN, start the recorder with START test button and note the meter reading. Turn S301 back to STAND BY. Disconnect the positive meter lead to TP No. 10 and connect the lead to TP No. 11 (V206 cathode). Turn S301 up to RUN, start the recorder with START test button and note the meter reading. The meter reading at TP No. 10 should be the same as the meter reading at TP No. 11 and within 10% of the previous reading. If the voltage reading has decreased by more than 10%, increase the MOTOR CONTROL R222 adjustment (see paragraph 6.3–2*a*).


4M
3M
1M
STEADY
START
RECORD
STOP

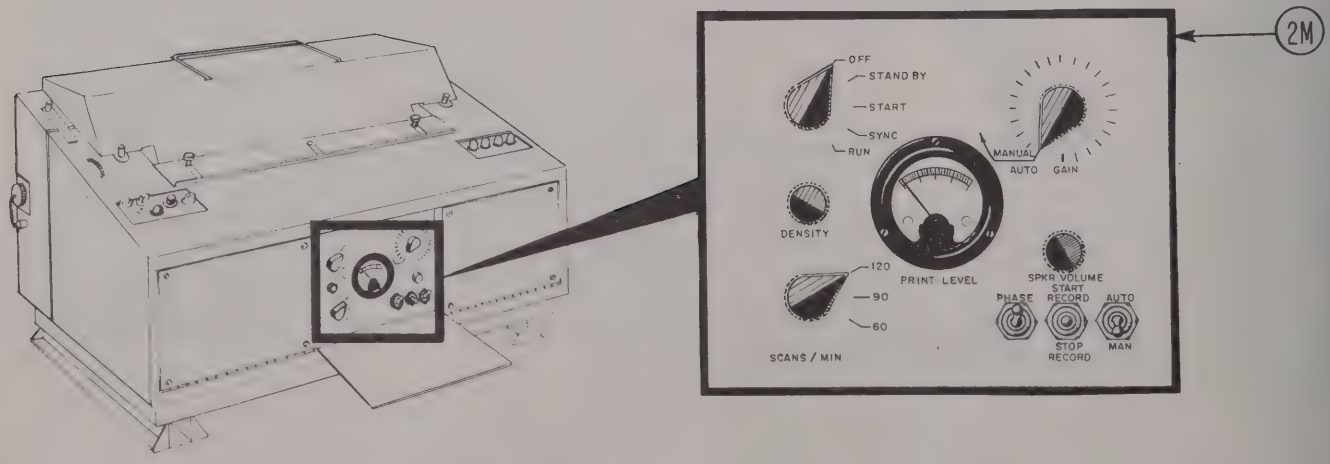
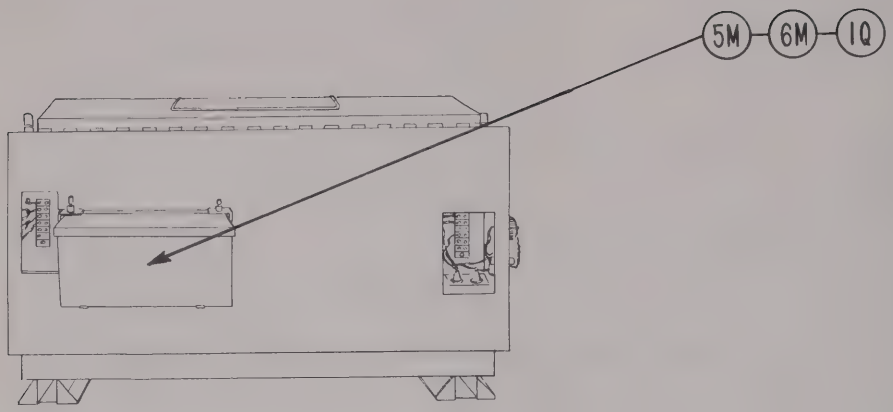

2M
OFF
STAND BY
START
SYNC
RUN
MANUAL
AUTO
GAIN
DENSITY
120
90
60
PRINT LEVEL
SCANS / MIN
SPKR VOLUME
START
RECORD
PHASE
AUTO
STOP
RECORD
MAN

TABLE 6–4. MONTHLY MAINTENANCE SCHEDULE

Operational controls as specified below.

STEP NO.	ACTION REQUIRED	PROCEDURE
1M	Check automatic control circuits.	Follow procedure outlined in table 5–1 and steps 8 through 11 of table 6–7.
2M	Check manual operation.	With AUTO/MAN switch at MAN, await a transmission and use operator controls per paragraph 3–3*c*(2). Equipment should phase on receipt of phase signals and record when facsimile signals start and the START RECORD switch is operated.
3M	Inspect transformers, chokes, plug-in capacitors and motors for evidence of overheating and leakage.	Record 1 hour or more of regular copy before checking. Some transformers, motors and chokes normally operate at case temperatures so hot that one's hand cannot be held on them for more than a second.
4M	Inspect motors and gears.	Turn equipment on up to RUN and start motor with test buttons (see table 5–1). Listen for any unusual motor or gear noises, or evidence of binding or excessive vibration. Open run, sync and paper feed gear boxes (paragraphs 6.3–4*b*, *i*, and *n*) and remove dirt with a nylon bristled brush or equivalent. Relubricate per figures 6–1 through 6–4. Replace any defective parts.


5M
6M
1Q

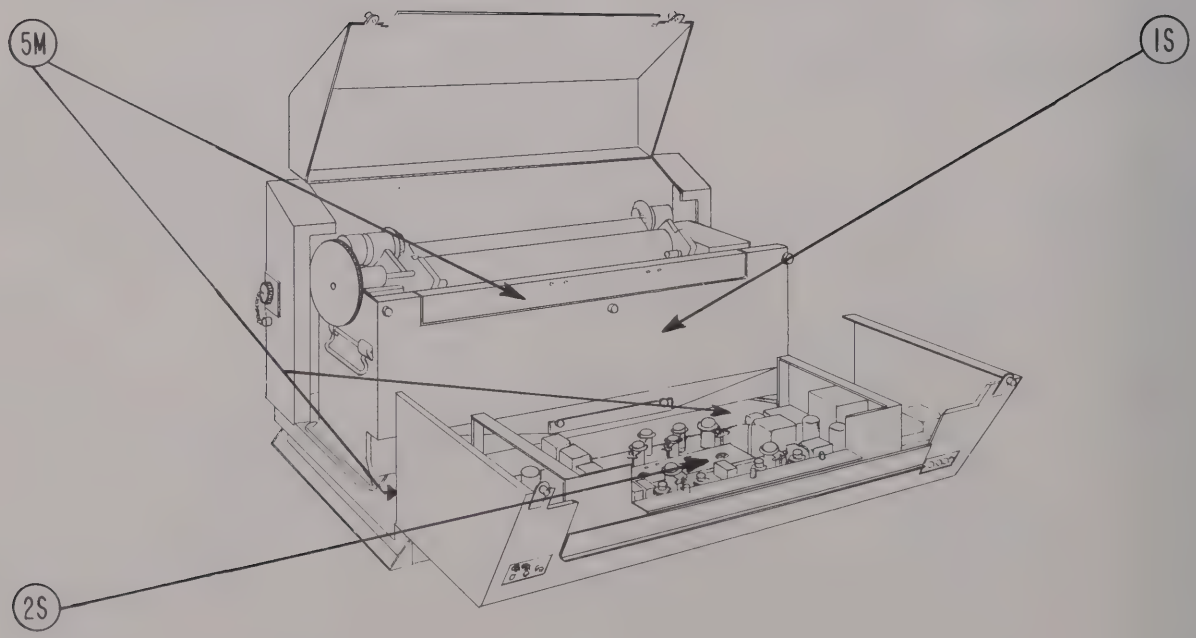

5M
1S
2S

TABLE 6–4. MONTHLY MAINTENANCE SCHEDULE (Cont)

Recorder Set, Facsimile AN/UXH-2
completely deenergized.

STEP NO.	ACTION REQUIRED	PROCEDURE
5M	Clean and re-oil filters.	Remove and clean filters from mech unit, cabinet base and canister assembly as described in paragraph 3–6*i*. If operating ambient temperature of AN/UXH-2 is 75°F and up, use SAE-30 lubricant conforming to MS-9110, specification MIL-L-9000. If operating ambient temperature of AN/UXH-2 is less than 75°F, use SAE-10 lubricant conforming to MS-9250, specification MIL-L-9000.
6M	Renew activated carbon.	Remove canister assembly (paragraph 3–6*b*). Holding canister assembly away from equipment, shake to expose fresh surfaces of the carbon.

TABLE 6–5. QUARTERLY MAINTENANCE SCHEDULE

Recorder Set, Facsimile AN/UXH-2
completely deenergized.

STEP NO.	ACTION REQUIRED	PROCEDURE
1Q	Replace activated carbon.	Remove canister assembly (see paragraph 3–6*b*) and replace activated carbon. If no fresh supply is available, follow procedure for step 6M, table 6–4.

TABLE 6–6. SEMI-ANNUAL MAINTENANCE SCHEDULE

STEP NO.	ACTION REQUIRED	PROCEDURE
1S	Lubricate sleeve bearings.	Remove mech unit from cabinet and apply lubricating oil to bearings as described in figures 6–1 through 6–4.
2S	Check that electrical circuits are properly aligned.	Follow procedure outlined in table 6–7.

6.1–5. LUBRICATION.

There are two types of bearings used in this equipment, ball bearings and oil-impregnated bronze sleeve bearings. The ball bearings do not need any cleaning or lubrication. Short of a rare need for replacement, these bearings should not be disturbed. On the other hand, the sleeve bearings do need some periodic lubrication. They are compressed bronze bearings with a natural retention ability to hold oil for a long period of time. Due to seepage and evaporation of the lubricant, the places with this type bearing should be lightly lubricated at least twice a year.

The type of lubricant, name of part to be lubricated, and application instructions are shown in Figures 6–1 through 6–4. It is recommended that the gears be lubricated every month, the sleeve bearings every six months (see tables 6–4 through 6–6). An oil can similar to SNSN 36-C-520 should be used to apply oil to the bearings, and a nylon-bristled brush or brush similar to SNSN 38-B-4480 should be used to apply grease to the gears.

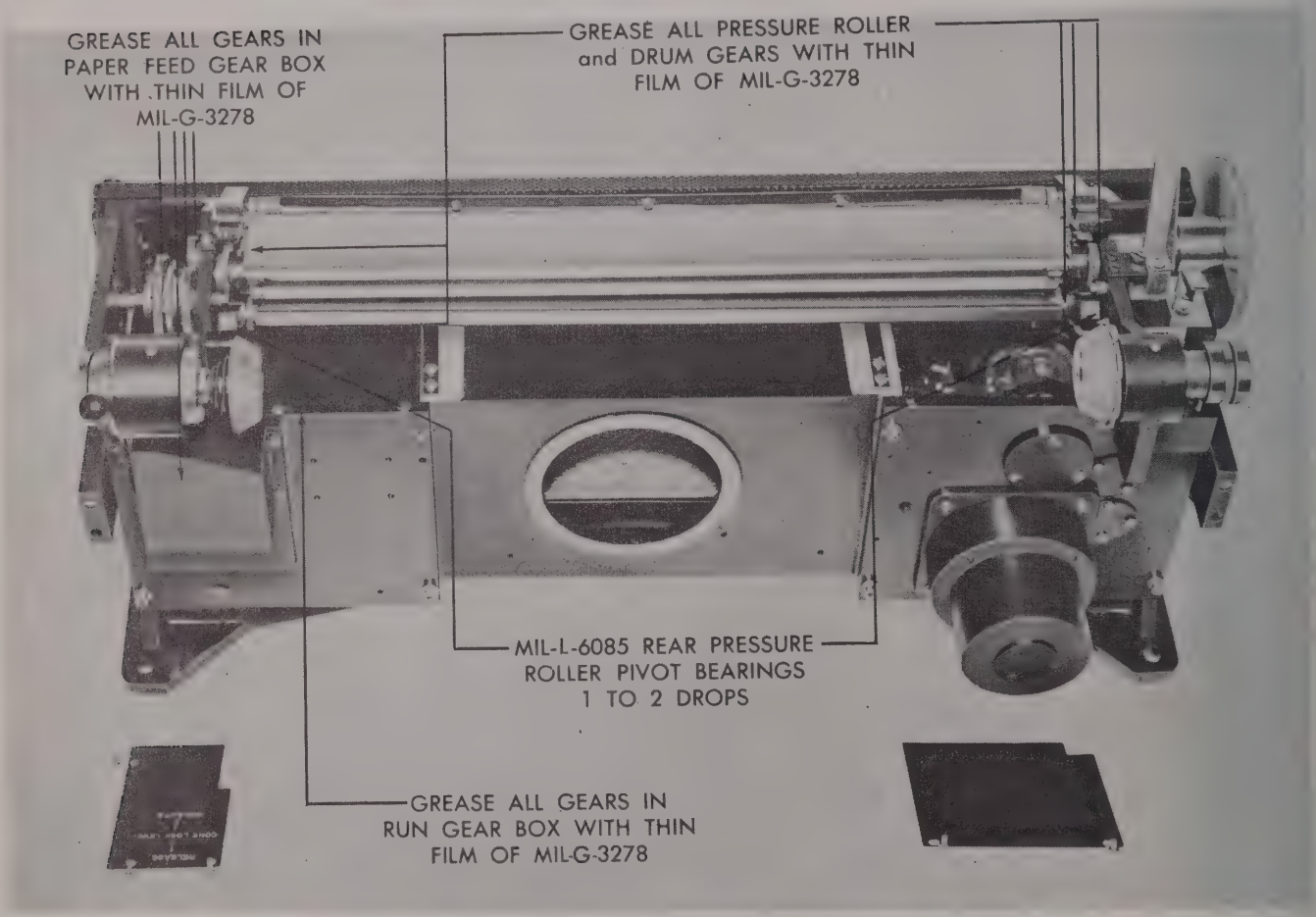

GREASE ALL GEARS IN PAPER FEED GEAR BOX WITH THIN FILM OF MIL-G-3278
GREASE ALL PRESSURE ROLLER and DRUM GEARS WITH THIN FILM OF MIL-G-3278
MIL-L-6085 REAR PRESSURE ROLLER PIVOT BEARINGS 1 TO 2 DROPS
GREASE ALL GEARS IN RUN GEAR BOX WITH THIN FILM OF MIL-G-3278

Figure 6–1. Recorder Set, Facsimile AN/UXH-2, Lubrication Chart, Rear of Mechanical Unit

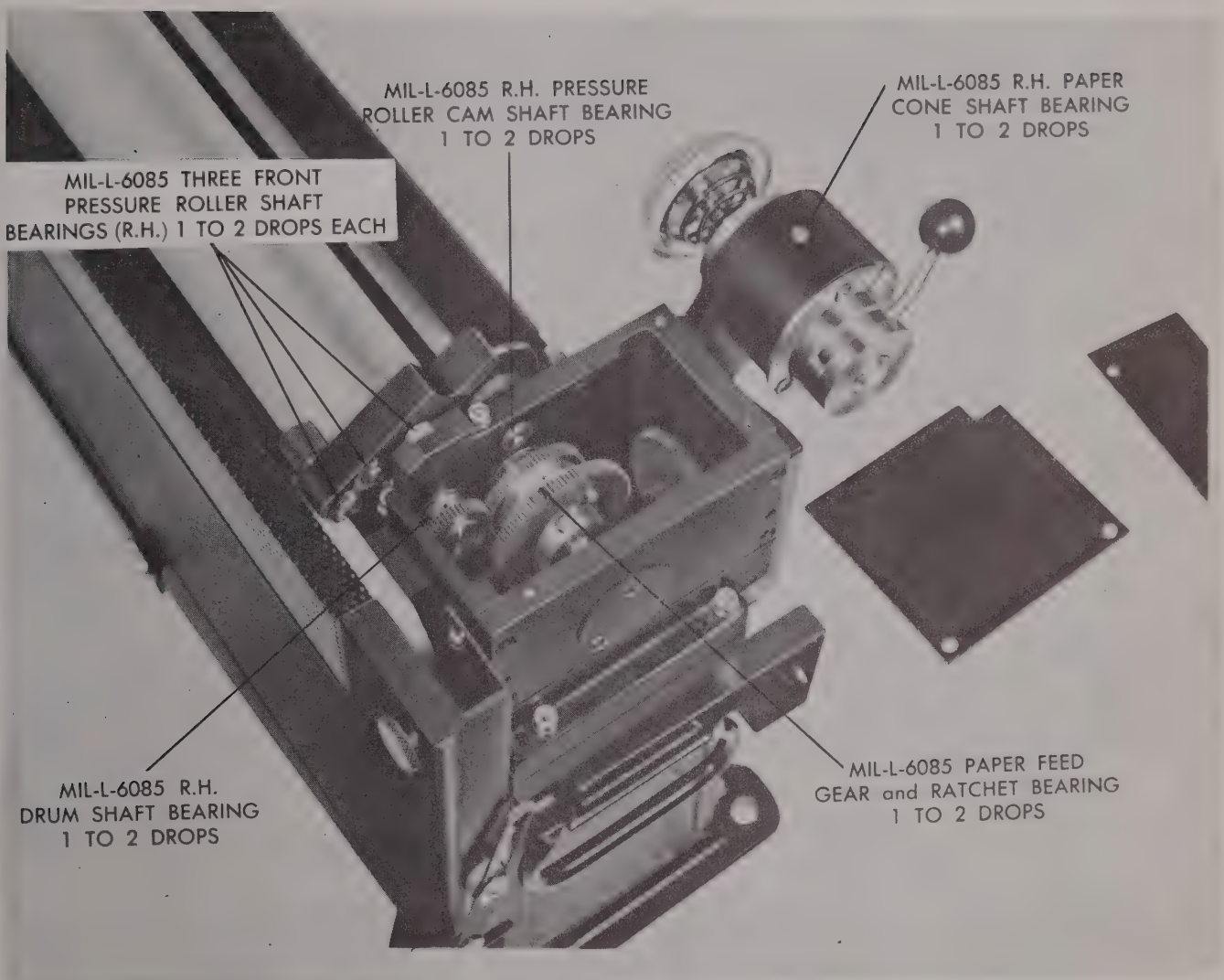


Figure 6–2. Recorder Set, Facsimile AN/UXH-2, Lubrication Chart, Right Hand Side of Mechanical Unit

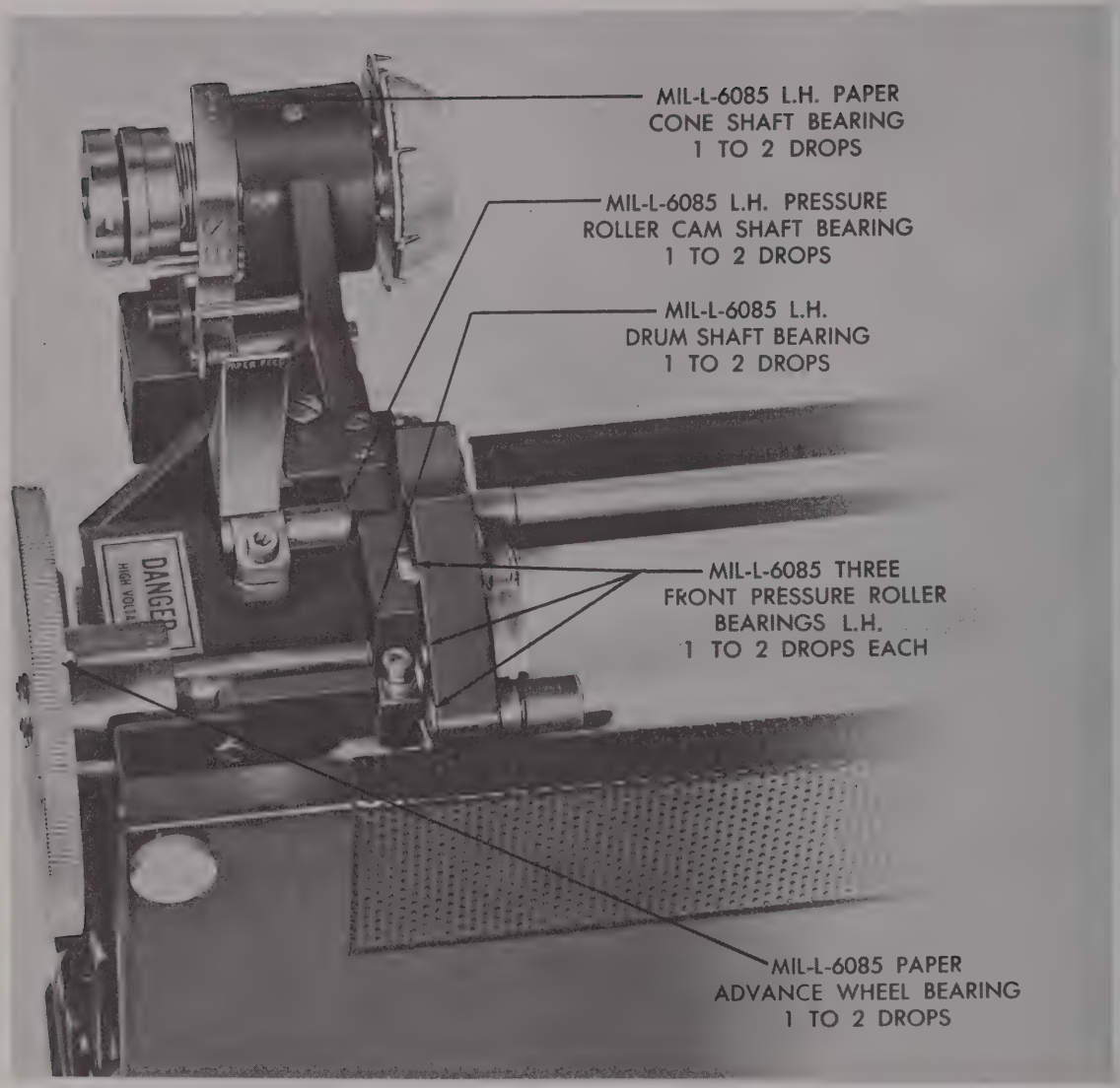


Figure 6—3. Recorder Set, Facsimile AN/UXH-2, Lubrication Chart, Left Hand Side of Mechanical Unit

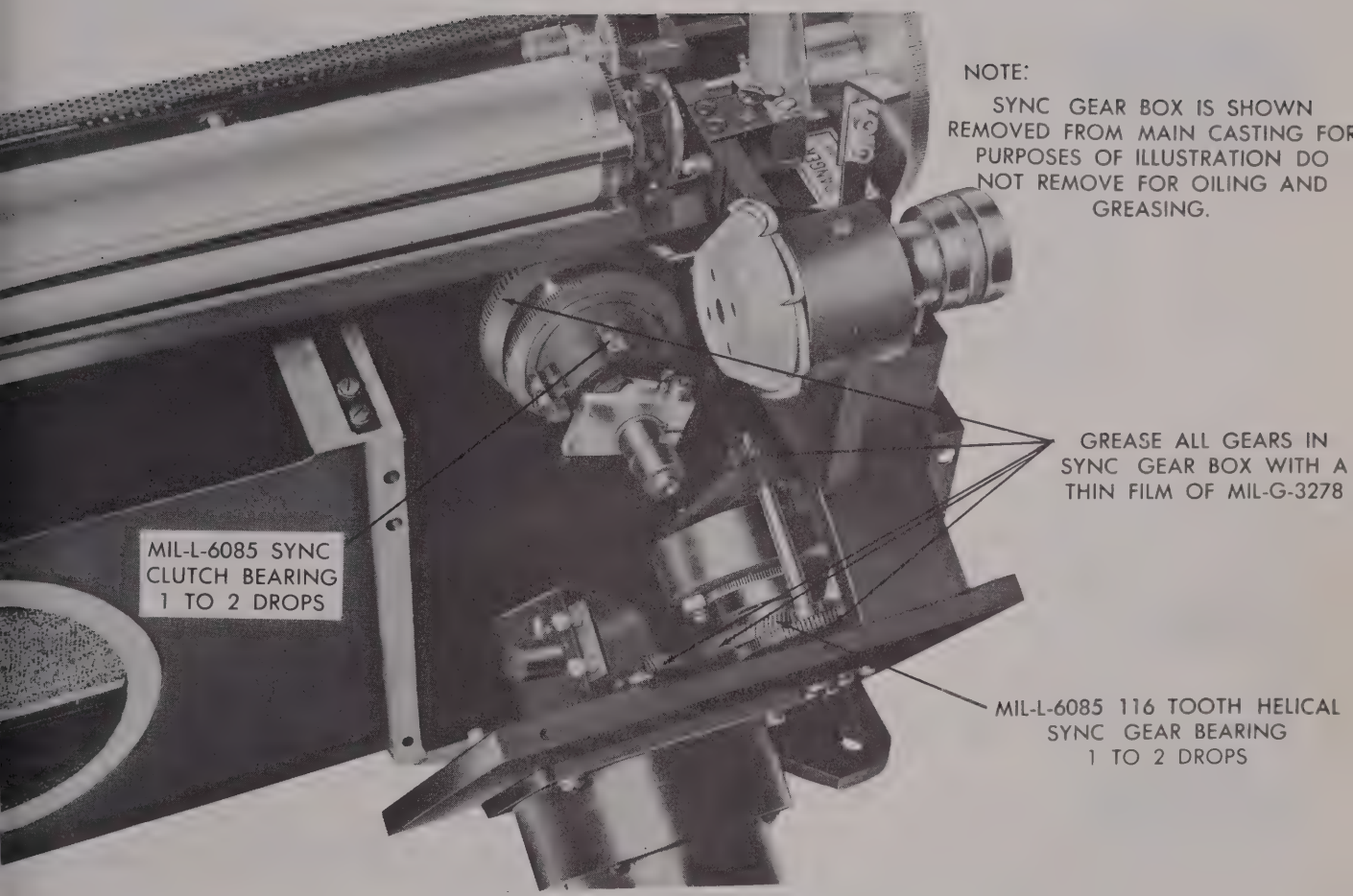
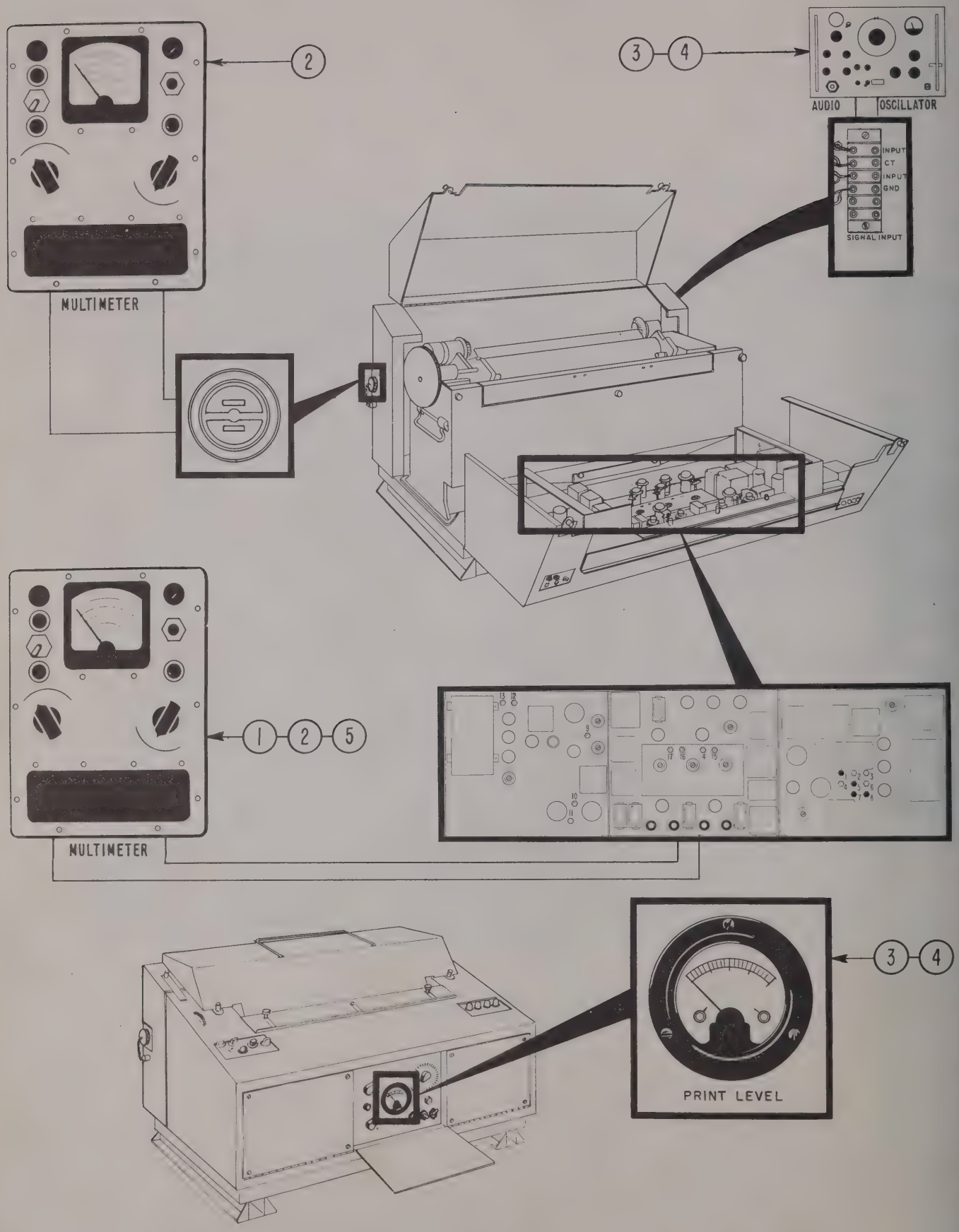

NOTE:
SYNC GEAR BOX IS SHOWN REMOVED FROM MAIN CASTING FOR PURPOSES OF ILLUSTRATION DO NOT REMOVE FOR OILING AND GREASING.
GREASE ALL GEARS IN SYNC GEAR BOX WITH A THIN FILM OF MIL-G-3278
MIL-L-6085 SYNC CLUTCH BEARING 1 TO 2 DROPS
MIL-L-6085 116 TOOTH HELICAL SYNC GEAR BEARING 1 TO 2 DROPS

Figure 6–4. Recorder Set, Facsimile AN/UXH-2, Lubrication Chart, Synchronous Gear Box


2
MULTIMETER
3
4
AUDIO
OSCILLATOR
INPUT
CT
INPUT
GND
SIGNAL INPUT
1
2
5
MULTIMETER
3
4
PRINT LEVEL

SUB-SECTION 6.2. PERFORMANCE STANDARDS

6.2–1. INTRODUCTION.

The performance standards described in this section apply to the performance of the functional sections and the complete installation. Only an engineer qualified on this equipment is authorized to change any of these standards. Standards are established upon completion of installation or yard overhaul, or when a major field change has been completed. When the standards are initially filled out, the numbers in parentheses below the lines in the "Performance Standards" column should be used as a guide to normal readings.

6.2–2. PERFORMANCE STANDARDS.

a. TOOLS REQUIRED FOR PERFORMANCE STANDARDS CHECKS. – A multimeter such as the ME-25/U series or AN/USM-34 series should be used to measure AC and DC voltages. A signal generator such as Audio Oscillator TS-382/U series is needed to check the equipment response and a radio receiver such as the RBD or RBC series is needed in conjunction with the frequency standard check. A compatible transmitter (see paragraph 1–3) is needed from which to receive copy to determine overall performance.

b. PERFORMANCE STANDARDS.

TABLE 6–7. PERFORMANCE STANDARDS CHART

AUTO/MAN switch and GAIN control both at AUTO.
S302 in 60-scan position. S301 turned up to RUN.

STEP NO.	ACTION REQUIRED	PRELIMINARY ACTION	READ INDICATION ON	PERFORMANCE STANDARDS
1	Measure RB+.	Set meter to 1000 VDC scale and connect positive side to TP No. 5 (B–) and negative side to TP No. 8 (RB+).	Multimeter ME-25/U or AN/USM-34 series.	_____VDC. (215 to 235)
2	Measure HI B+.	Set meter to 300 VAC scale and connect across auxiliary power outlet J601 to determine the power line voltage.	Multimeter ME-25/U or AN/USM-34 series.	_____VAC. (90 to 130 or 180 to 260)
		Note whether S401 is in HIGH or LOW position.		_____
		Set meter to 1000 VDC scale and connect positive side to TP No. 5 (B–) and negative side to TP No. 7 (HI B+).	Multimeter ME-25/U or AN/USM-34 series.	_____VDC. (350 to 420) This reading will vary directly with the AC power line voltage providing S401 is in the same position.
3	Check signal amplifier circuit.	Feed a fixed frequency and amplitude signal of 1800 cps at –10 dbm from Audio Oscillator TS-382/U to the INPUT terminals of the AN/UXH-2.	Front panel PRINT LEVEL meter.	_____ (50 to 100)
4	Check ALC circuit.	Reduce amplitude of signal from TS-382/U 10 db.	Front panel PRINT LEVEL meter.	Meter should dip momentarily and then come back to within (2) divisions of the reading in step 3.
5	Check print amplifiers.	Turn GAIN control back to AUTO. Set meter to 50 VAC scale and connect across TP No. 1 (V5, V6 screens) and TP No. 5 (B–). Feed signal from oscillator as in step 3.	Multimeter ME-25/U or AN/USM-34 series.	_____VAC. (20 to 30)

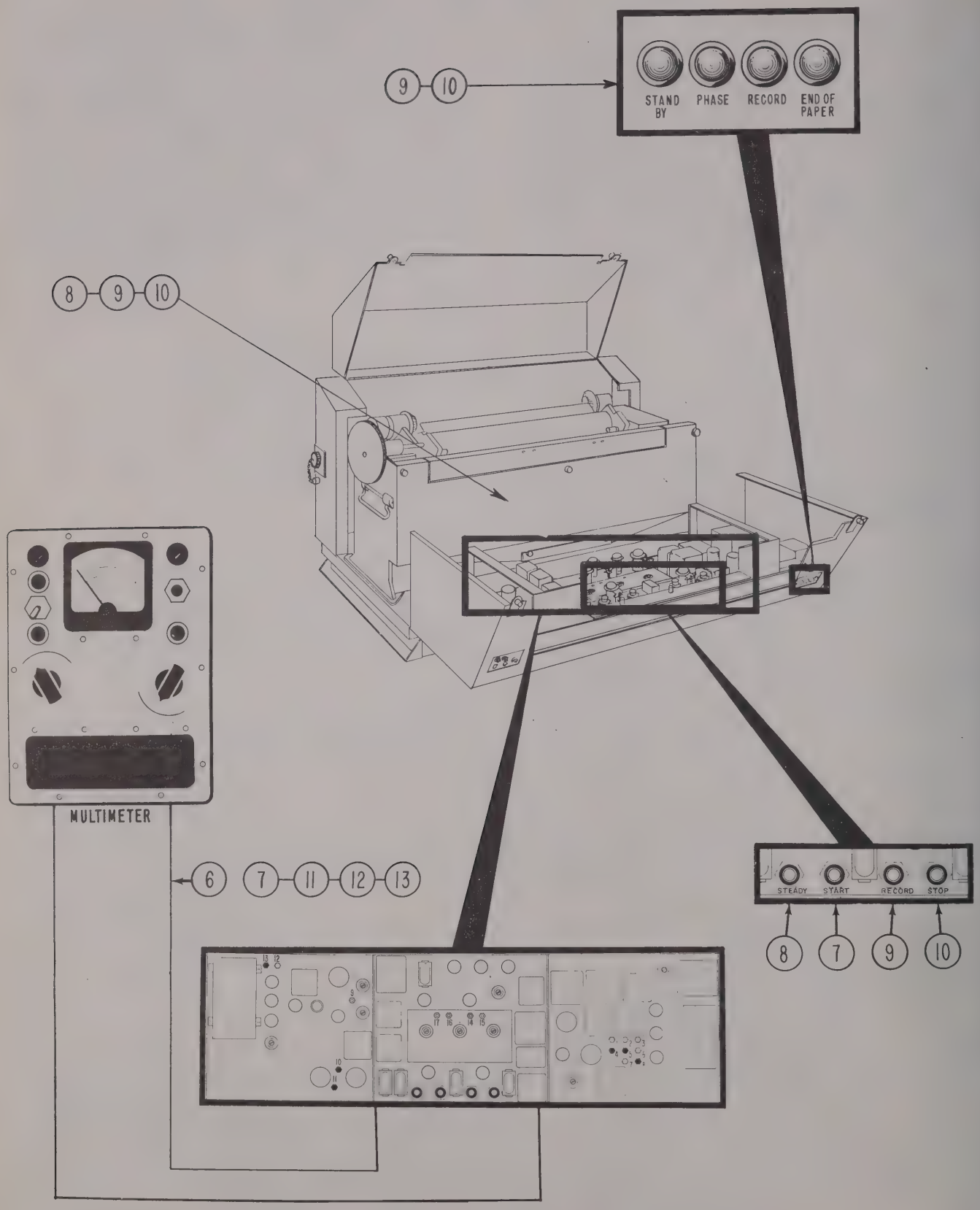
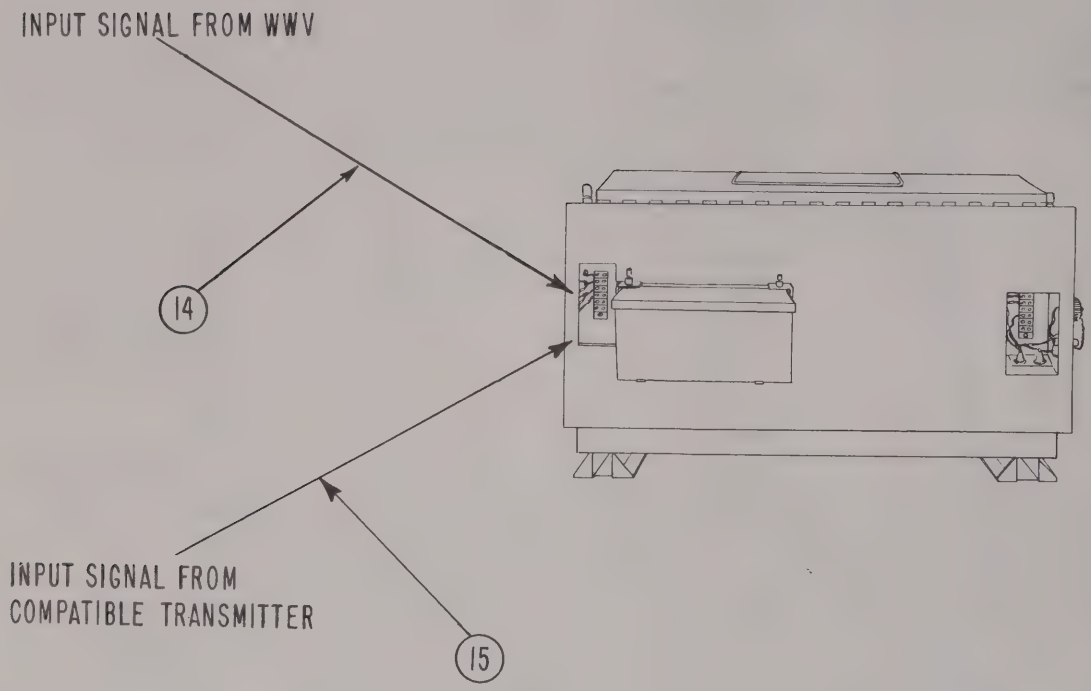

9
10
STAND BY
PHASE
RECORD
END OF PAPER
8
9
10
MULTIMETER
6
7
11
12
13
STEADY
START
RECORD
STOP
8
7
9
10

TABLE 6–7. PERFORMANCE STANDARDS CHART (Cont)

Audio Oscillator disconnected from INPUT terminals.
P101 disconnected from J101.
AUTO/MAN switch and GAIN control both at AUTO.
S302 in 60-scan position. S301 turned up to RUN.

STEP NO.	ACTION REQUIRED	PRELIMINARY ACTION	READ INDICATION ON	PERFORMANCE STANDARDS
6	Check control circuits.	Set meter on 300 VDC scale and connect the negative side to TP No. 4 (V120B plate) and the positive side to TP No. 8 (RB+).	Multimeter ME-25/U or AN/USM-34 series.	_____VDC. (75 to 100)
7	Check control circuits.	Press START test button.	Multimeter ME-25/U or AN/USM-34 series.	Voltage decreases to _____ (30 to 50) VDC and K101 deenergizes (STAND BY light goes out, PHASE light comes on) in _____ seconds. (2 to 5) Buzzing heard for _____ seconds (2 to 5) after START button pressed.
8	Check phasing circuit and phase actuator operation.	Press STEADY test button and release it momentarily to simulate a phasing pulse.		Buzzing sound should be heard when STEADY button is released.
9	Check control circuits and band drive system.	Press RECORD TEST button.		RECORD light comes on, run motor starts and band rotates with _____ seconds. (2 to 5)
10	Check control circuits.	Press STOP test button.		Run motor stops, RECORD light goes out and STAND BY light comes on in _____ seconds. (2 to 5)
11	Check fork oscillator circuit.	Set meter to 25 VAC scale and connect across TP No. 13 (V202 cathode) and TP No. 5 (B—).	Multimeter ME-25/U or AN/USM-34 series.	_____VAC. (2.5 — 3)
12	Check motor drive circuit.	Set meter to 25 VAC scale and connect across TP No. 10 (V207 cathode) and TP No. 5 (B—).	Multimeter ME-25/U or AN/USM-34 series.	_____VAC. (5 — 10)
13	Check motor drive circuit.	Set meter to 25 VAC scale and connect across TP No. 11 (V206 cathode) and TP No. 5 (B—).	Multimeter ME-25/U or AN/USM-34 series.	_____VAC. (5 — 10) This reading should be the same as in step 12, ±10%.


INPUT SIGNAL FROM WWV
14
INPUT SIGNAL FROM
COMPATIBLE TRANSMITTER
15

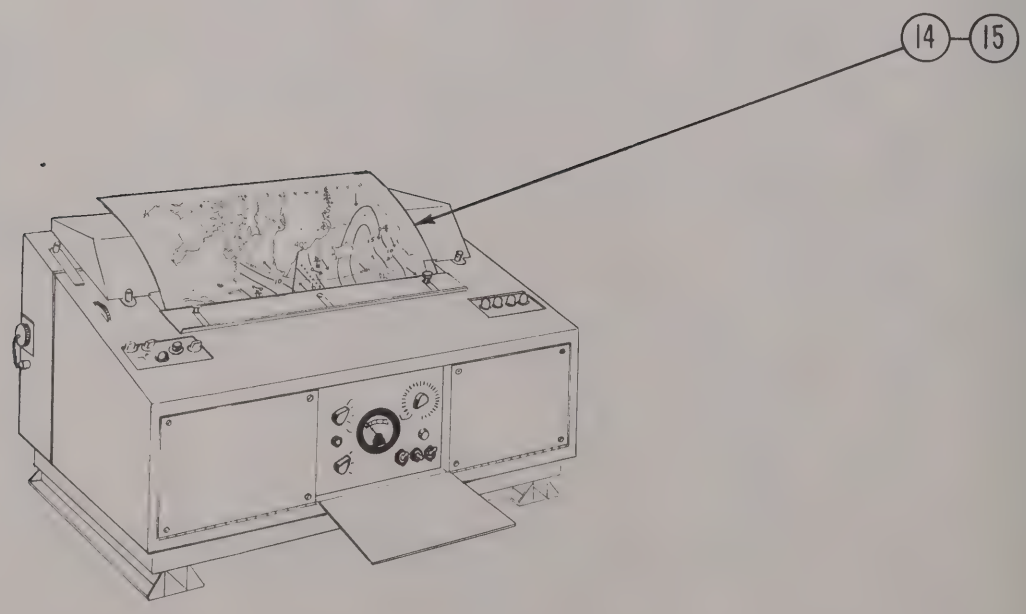

14
15

TABLE 6–7. PERFORMANCE STANDARDS CHART (Cont)

AUTO/MAN switch at MAN.
GAIN control at AUTO.
P101 connected to J101.
Output of radio receiver connected to INPUT terminals of AN/UXH-2.

STEP NO.	ACTION REQUIRED	PRELIMINARY ACTION	READ INDICATION ON	PERFORMANCE STANDARDS
14	Check frequency standard.	Receive pulses from WWV as described in paragraph 6.3–2*e*.	Recording paper	_____skew. Maximum limit 1/8 inch per foot of copy.
15	Check overall equipment performance.	Record copy from a compatible transmitter (see paragraph 1–3).	Recording paper	Copy has appearance of that in figure 5–1.

SUB-SECTION 6.3. REPAIR.

6.3–1. FAILURE REPORT.

Report each failure of the equipment, whether caused by a defective part, wear, improper operation, or an external cause. Use ELECTRONIC FAILURE REPORT form DD 787. Each pad of the forms includes full instructions for filling out the forms and forwarding them to the Bureau of Ships However, the importance of providing complete information cannot be emphasized too much. Be sure that you include the model designation and serial number of the equipment (from the equipment identification plate), the type number and serial number of the major unit (from the major unit identification plate), and the type number and reference designation of the particular defective part (from the technical manual). Describe the cause of the failure completely, continuing on the back of the form if necessary. Do not substitute brevity for clarity. And remember – there are are two sides to the failure report –

"YOUR SIDE"

Every FAILURE REPORT is a boost for you:
1. It shows that you are doing your job.
2. It helps make your job easier.
3. It ensures available replacements.
4. It gives you a chance to pass your knowledge to every man on the team.

"BUREAU SIDE"

The Bureau of Ships uses the information to:
1. Evaluate present equipment.
2. Improve future equipment.
3. Order replacements for stock.
4. Prepare field changes.
5. Publish maintenance data.

Always keep a supply of failure report forms on board. You can get them from the Nearest District Publications and Printing Office.

6.3–2 MAINTENANCE CONTROL ALIGNMENT.

All the maintenance controls are set at the factory for optimum operation under normal conditions. Methods of adjusting to the optimum values and ways of compensating for abnormal operation are described below.

A multimeter such as the ME-25/U or AN/USM-34 series is necessary to read voltages and currents, a signal generator such as Audio Oscillator TS-382/U is needed as a signal source, and a radio receiver such as the RBD or RBC should be used to receive WWV pulses if it is ever necessary to check the frequency standard.

For each of these measurements except as noted in sub-paragraphs *a* and *e*, the selector switch should be in STAND BY, the AUTO/MAN switch and GAIN control both at AUTO, and plug P101 disconnected from the electrical chassis. In all but sub-paragraphs *c*, *d*, *e*, and *g*, S302 should be in the 60-scan position.

The locations of these controls are shown in figure 5–3.

Mechanical adjustments are described in paragraph 6.3–4.

a. MOTOR CONTROL, R222.

(1) Set multimeter to 25 VAC scale.

(2) Connect negative side of multimeter to TP No. 5 (B—) and the positive side of the multimeter to TP No. 10 (V207 cathode).

(3) Turn selector switch up to RUN and start recorder with START test button.

(4) Adjust R222 so that the multimeter reads 10 to 12 VAC.

(5) Connect positive side of the multimeter to TP No. 11 (V206 cathode).

(6) The multimeter should read the same, ±10% as the reading noted in step (4). If it does not check the tubes V206 and V207 and transformer T201.

(7) For reference, the reading at the 90-scan position of S302 and at the 120-scan position will be the same as at the 60-scan position.

b. RUN MOTOR ADJUST CONTROL, 60 SCANS, R130.

(1) Set multimeter to 100 VAC scale.

(2) Connect negative side of multimeter to TP No. 14 (run motor, common) and the positive side of the multimeter to TP No. 15 (run motor, 60 scans).

(3) Adjust R130 for the lowest voltage which gives good quality recorded copy and brings the band up to speed at the start of recording. Set R130 so that the voltage is 5 volts higher than this unless the power line voltage and frequency where the equipment is installed vary considerably. In this case R130 should be set when the power line voltage and frequency are lowest or the voltage should be set higher than the 5 volts increase specified above. The life of the stylus band will be appreciably increased if the lowest voltage is used which gives good quality recording. If a voltage higher than 55 VAC is required, the mechanical unit should be carefully inspected for excessive tightness in the run system.

c. RUN MOTOR ADJUST CONTROL, 90 SCANS, R131.

(1) Set multimeter to 100 VAC scale.

(2) Connect negative side of multimeter to TP No. 14 (run motor, common) and the positive side of the multimeter to TP No. 16 (run motor, 90 scans).

(3) Adjust R131 in the same manner as specified for R130 in *b*(3).

d. RUN MOTOR ADJUST CONTROL, 120 SCANS, R132.

(1) Set multimeter to 100 VAC scale.

(2) Connect negative side of multimeter to TP No. 14 (run motor, common) and the positive side of the multimeter to TP No. 17 (run motor, 120 scans).

(3) Adjust R132 in the same manner as specified for R130 in *b*(3).

e. FORK CONTROL, R221.—The fork controlled audio-frequency oscillator generally does not require any adjustment. *Do not touch the adjustment control until it is absolutely established that the oscillator is off frequency.* Station WWV of the National Bureau of Standards transmits signals that can be used for checking and adjusting the fork frequency. A pulse occurring once each second modulates transmissions at 2.5, 5, 10, 15, 20, 25, 30 and 35 mc. To check the fork frequency against this standard, proceed as follows:

(1) Connect plug P101 into J101 on the electrical chassis.

(2) Connect the output of the receiver to the INPUT terminals of the AN/UXH-2.

(3) Set AUTO/MAN switch at MAN, GAIN control at AUTO, and S302 at the 120 SCANS/MIN position. Turn the selector switch up to RUN and start the recorder with the START RECORD switch.

(4) Using the speaker of the facsimile recorder, tune a radio receiver such as RBD or RBC to a WWV transmission and adjust to accentuate the pulse occurring once each second.

(5) Record the pulse from WWV for about 10 minutes.

(6) Stop the recorder with the STOP RECORD switch.

(7) Measure the change in position of the start of the recorded pulse in 12 inches of copy.

(8) If the displacement measured in step (7) is more than one-eighth of an inch in either direction, adjust FORK CONTROL R221. One-eighth of a turn in a clockwise direction will shift the recorded position about one-quarter of an inch to the left in 12 inches of copy. An eighth of a turn in the counterclockwise direction will shift the recorded position about one-quarter of an inch to the right in 12 inches of copy.

(9) Recheck the fork frequency by repeating steps (5) through (8) until the displacement is less than one-eighth of an inch.

f. CONTRAST CONTROL, R27 — If the background prints, or light markings on the original do not show on the recorded copy, compensation can be made by adjusting R27. Rotating R27 clockwise will increase the copy contrast and reduce the background. Rotating R27 counterclockwise to decrease the contrast will bring up the background and show light markings on the copy. The range of adjustment available from R27 is affected by the setting of the ALC OUTPUT control R30 (see paragraph 6.3–2*i*).

g. PHASE CONTROL, R236. — R236 permits shifting the position at which phasing occurs over a range of about one-half an inch in either direction. This control should be adjusted with the set operating at 120 SCANS/MIN; phasing at the other speeds will then fall into position. Rotating R236 counterclockwise 45° to make the resistance smaller moves the phasing position about 5/64 of an inch to the left. Rotating R236 clockwise 45° moves the phasing position about 5/64 of an inch to the right.

h. RB+ CONTROL, R126.

(1) Set a multimeter to the 1000 VDC scale.

(2) Connect the negative side of the meter to TP No. 5 (B—) and the positive side of the meter to TP No. 8 (RB+).

(3) Adjust R126 so that the meter reads 225 volts.

i. ALC OUTPUT, R30. — Potentiometer R30 adjusts the range available from the CONTRAST CONTROL R27.

(1) With the equipment set for 60 SCANS/MIN operation, feed a steady signal of 1800 cps at —10 dbm into the INPUT terminals.

(2) Rotate the CONTRAST CONTROL R27 to the max clockwise position.

(3) Adjust the ALC OUTPUT control R30 so that the front panel meter reads 100.

(4) Rotate the CONTRAST CONTROL to the max counterclockwise position.

(5) The change in the front panel meter reading should not be more than ½ a division. If the change is greater than this, readjust R30 until the meter does not change more than ½ a division when R27 is rotated from the full clockwise to the counterclockwise position.

6.3–3. REMOVAL, REPAIR AND REASSEMBLY OF ELECTRICAL CHASSIS (AMPLIFIER, ELECTRICAL CONTROL AM-1845/UXH-2) (Z100) PARTS AND SUBASSEMBLIES.

The electrical chassis may be serviced while it is mounted in the cabinet, but can be replaced as a complete unit if necessary.

a. ACCESS TO WIRING AND CIRCUIT COMPONENTS.—Access to the component wiring on the right or left side of the electrical chassis is achieved by loosening the two screws on the panels at each side of the front of the equipment and lowering the panel. To get to the component wiring of the control panel or hinged panel, open the equipment, loosen the three knurled captive screws in the front center of the electrical chassis in front of the test switches, and raise the hinged panel.

Figure 3–8 shows the tube locations and figures 6–25 through 6–28, the wiring layout and location of the components of the electrical chassis.

There are four spare wires in the cable from the electrical chassis to the interconnecting terminal boards which may be used as emergency repair if any wire in the electrical chassis cable becomes defective. One end of a gray/red wire is connected to pin 19 of TB602; a gray/black wire, connected to pin 20 of TB602; a black wire, connected to pin 39 of TB604; and one end of a black wire is connected to pin 40 of TB604. The other

end of each of these wires is coiled and laced to a bracket on the rear side of the control panel.

b. REMOVAL OF THE ELECTRICAL CHASSIS.

(1) Disconnect the power cord from the AC source.

(2) Open the equipment. Loosen the captive knurled screw on the interconnecting terminal board.

(3) Disconnect the 31 leads of the electrical chassis cable to the terminal boards (see table 6–8).

TABLE 6–8. ELECTRICAL CHASSIS CABLE CONNECTIONS TO TERMINAL BOARDS.

COLOR CODE	TERMINAL BOARD	PIN NUMBER	SIDE
gray	TB601	2	left
gray/yellow	TB601	3	left
gray/orange	TB601	6	left
gray/green	TB601	7	left
brown	TB601	8	left
brown/orange	TB601	9	left
gray/blue	TB601	10	left
black	TB602	11	right
brown/red	TB602	12	right
brown/red	TB602	13	right
red/blue	TB602	14	right
violet/orange	TB602	15	right
white	TB602	18	right
gray/red	TB602	19	right
gray/black	TB602	20	right
yellow/orange	TB603	22	left
black/red	TB603	23	left
black/white	TB603	25	left
black/green	TB603	26	left
black/yellow	TB603	27	left
blue (shielded)	TB603	29	left
shield	TB603	30	left
blue (shielded)	TB604	31	right
shields	TB604	32	right
blue (shielded)	TB604	33	right
red	TB604	34	right
red/yellow	TB604	35	right
red/green	TB604	36	right
red/white	TB604	37	right
gray/black	TB604	39	right
black	TB604	40	right

Note

If it is necessary to move the electrical chassis a short distance away from the cabinet, after which it will be replaced in the equipment, instead of disconnecting the 31 leads from the electrical chassis cable to the terminal boards, it is simpler to take the terminal boards out with the chassis. Remove the two 6-32 x 3/8 binding head screws mounting the cover over pins 1, 2 and 3 of TB601 and the two 6-32 x 5/8 binding head screws mounting each terminal board to the cabinet. Remove the 6-32 x 1/2 binding head screw, fastening the cable clamp to the cabinet base, but the clamp may be left on the cable.

CAUTION

The AC power line leads are exposed when the cover is removed from TB601 pins 1, 2 and 3.

(4) Close the front portion of the cabinet and take out the four 10-32 x 1/2 binding head screws holding the fuse panel to the cabinet on the left side of the sloping panel.

(5) Take out the four 10-32 x 1/2 binding head screws holding the indicator light panel to the cabinet on the right side.

(6) Remove the 14 10-32 x 1/2 hex head slotted cap screws in the recess under the front of the equipment. (These screws hold the rear of the electrical chassis to the cabinet.)

(7) Open the front portion of the cabinet, loosen the three knurled captive screws in the front center of the electrical chassis in front of the test switches and, using the knurled screws as a handle, raise the hinged panel to gain access to the control panel mounting screws. Insert a screw driver through the four holes in the frame around the control panel and remove the four 10-32 x 1/2 binding head screws mounting the control panel to the cabinet front.

(8) Remove the top bracket of either the left or right hinge assembly (MP133 or MP134) by taking out the two 6-32 x 1/2 binding head screws that mount the bracket to the side wall, to gain sufficient clearance to maneuver the chassis out of the cabinet.

(9) Take out the 12 10-32 x 1/2 hex head slotted cap screws holding the front of the chassis to the cabinet and carefully lift the whole unit from the cabinet.

When replacing the electrical chassis, replace all the mounting screws as described above, and make sure the wires are connected to the proper terminal board pins. Each wire is labeled near the spade lug with the number of the pin to which it is to be connected — or refer to table 6–8.

6.3-4. REMOVAL, ADJUSTMENT, REPAIR AND REASSEMBLY OF THE MEH UNIT (RECORDER, FACSIMILE RO/76UXH-2) (Z500), PARTS AND SUBASSEMBLIES.

Repairs to the stylus and band assemblies can be made with the mech unit in the cabinet, but to service the run or sync gear systems, and most of the paper feed components, the mech unit must be taken out of the cabinet.

Removal of the mech unit is described in paragraph 6.3–4*a*; removal, adjustment, repair and reassembly of the mech unit components are described in paragraphs 6.3–4*b* through 6.3–4*v*, except that removal of the band, changing the stylus needles, aligning the stylus holder assemblies, and checking and straightening the stylus needles are described in paragraph 3–6.

In addition to the stylus holder assembly and stylus needle alignment fixtures, the tool box under the cabinet hood contains a small screw driver, three retainer ring pliers and five hex keys (see Table 1–1 and figure 5–2).

The following additional tools are necessary to properly make repairs to the recorder.

Spring scales to measure five to ten grams, ten to 25 ounces, and two to two and a half and four to four and a half pounds are needed to measure tensions.

A screw driver with screw-holding facilities and an offset screw driver are useful, and a light hammer and pin punch are necessary to knock out roll or taper pins.

A .023-inch feeler gauge is needed to measure the phase actuator armature gap.

a. REMOVAL OF THE MECH UNIT.

(1) Remove the power cord from the AC source.

(2) Open the equipment. Loosen the knurled captive screw on the interconnecting terminal board cover and uncover the terminal boards (figure 2–2).

(3) Disconnect the 16 leads from the mech unit cable to the terminal boards (see table 6–9).

TABLE 6–9. MECH UNIT CABLE CONNECTIONS TO TERMINAL BOARDS

COLOR CODE	TERMINAL BOARD	PIN NUMBER	SIDE
yellow/orange	TB603	22	right
black/red	TB603	23	right
gray/green	TB603	24	right
black/white	TB603	25	right
black/green	TB603	26	right
black/yellow	TB603	27	right
black	TB603	28	right
blue (shielded)	TB603	29	right
shield	TB603	30	right
blue (shielded)	TB604	31	left
shields	TB604	32	left
blue (shielded)	TB604	33	left
red	TB604	34	left
red/yellow	TB604	35	left
red/green	TB604	36	left
red/white	TB604	37	left

(4) Remove the two 10-32 x ¾ hex head slotted cap screws fastening the bracket at each side of the mech unit to the brackets welded to the cabinet.

(5) Remove the two ⅜-24 x 1¼ hex head slotted cap screws and No. ⅜ flat washers mounting each side of the mech unit casting to the cabinet bottom.

(6) Lift the mech unit out of the cabinet by means of the handle on each side.

CAUTION

Handle the mech unit with care to avoid damaging the band.

When reassembling the mech unit into the cabinet, make sure the wires are connected to the proper terminal board pins. Each wire is marked near the spade lug with the pin number to which it should be connected; or refer to table 6–9.

b. STYLUS HOLDER ASSEMBLY (figure 4–14).—Realignment of the stylus holder assembly is usually required only after replacing a broken or damaged leaf spring and is described in paragraph 3–6*e*. Taking the stylus holder assembly apart is not necessary to repair the bushing or pressure spring; but to replace the stylus holder, leaf damper or leaf spring assembly, break down of the stylus holder assembly is described in paragraph 4*b* (3). After replacing a damaged component reassemble the stylus holder assembly in the reverse order of that specified.

(1) STYLUS PRESSURE SPRING (MP8).

(*a*) With the equipment connected to an AC source and the AUTO/MAN switch at MAN, turn the selector switch to STAND BY.

(*b*) Open the cabinet and mech unit cover to gain access to the band.

(*c*) Bring the suspected stylus assembly to either the left or right hand side of the machine by turning the wheels *clockwise only* and remove the stylus needle (paragraph 3–6*a*).

(*d*) Bend the wire spring towards the bushing and beyond the face of the bushing so that when released it will assume a position near the rear face of the bushing.

At this setting there will be approximately five to ten grams force on the needle.

(2) STYLUS BUSHING (MP3).—The stylus bushings are hard chrome plated with a jewel bearing in each end of the inner hole. After long use, the bushing may wear flat where it rubs along the trolley bar, but it can easily be rotated so that a fresh surface will be in contact with the trolley bar. On the assumption that the bushings will each wear at approximately the same rate, it is good practice, when rotating the bushing of one stylus holder, to rotate the other two bushings as well.

When rotating or replacing the stylus bushings, do not use forces great enough to move or damage the stylus leaf spring.

There are four small equally spaced holes in the ends of the bushings into which the end of a paper clip or small metal pick may be inserted to turn the bushing.

(*a*) With the equipment connected to an AC source and the AUTO/MAN switch at MAN, turn the selector switch to STAND BY.

(*b*) Open the cabinet and mech unit cover to gain access to the band.

(*c*) Bring the stylus assembly to either the left or right hand side of the machine by turning the wheels *clockwise only* and remove the stylus needle (paragraph 3—6*a*).

(*d*) Insert the end of a paper clip or small metal pick in an accessible hole in the bushing and, holding the leaf spring to prevent damaging it, rotate the bushing so that the spot where it is worn flat will not be under any of the fingers of the leaf spring or in a position to contact the trolley bar. (Rotating approximately 120° is recommended.)

(*e*) To remove the bushing from the stylus holder assembly, insert a small screw driver or point of a pick into the "V" shaped space between the bushing and the leaf spring fingers. Holding the leaf spring to prevent damage thereto, exert slight pressure on the bushing and it will pop out. Do not use enough force to damage the spring.

(*f*) To replace the bushing, position it so that the groove around the middle is centered on the center guide finger of the leaf spring and so that no worn spot is under any of the leaf spring fingers or in a position to contact the trolley bar. Press firmly. The bushing will snap into position. Check that the center guide spring has fallen into the groove on the bushing.

(3) TAKING THE STYLUS HOLDER ASSEMBLY APART.

(*a*) Remove the band per paragraph 3—6*d*.

(*b*) Remove the two 2-56 x 3/16 screws and light lockwashers on top of the stylus holder (the nylon block) and the leaf damper (MP4), leaf spring assembly, and bushing (MP3) will all come apart from the stylus holder.

c. STYLUS BAND.—If the lugs on the stylus band slip by the sync arm, or if the band is damaged so that it does not produce good copy, it must be replaced. Before replacing the band, however, make sure the stylus holder assemblies or stylus needles are not causing the trouble. See paragraphs 3—6*d*, *e* and *f*.

Remove the band and set the stylus holder alignment with the fixture provided as described in paragraph 3—6*e*.

Note

It is necessary when setting alignment to set all three assemblies.

d. TROLLEY BAR (MP119) (figures 4—10, 6—5)—Line grouping or non-uniform line spacing (figure 5—1D) may be caused by a misaligned or improperly positioned trolley bar, but other causes such as dirty stylus bushings, a deformed stylus leaf spring, bent stylus needle, worn stylus bushing or defective band should be investigated first. If none of these seems to be at fault, adjust the trolley bar downward. Raising or lowering the trolley bar affects the spring loading on the stylus assemblies.

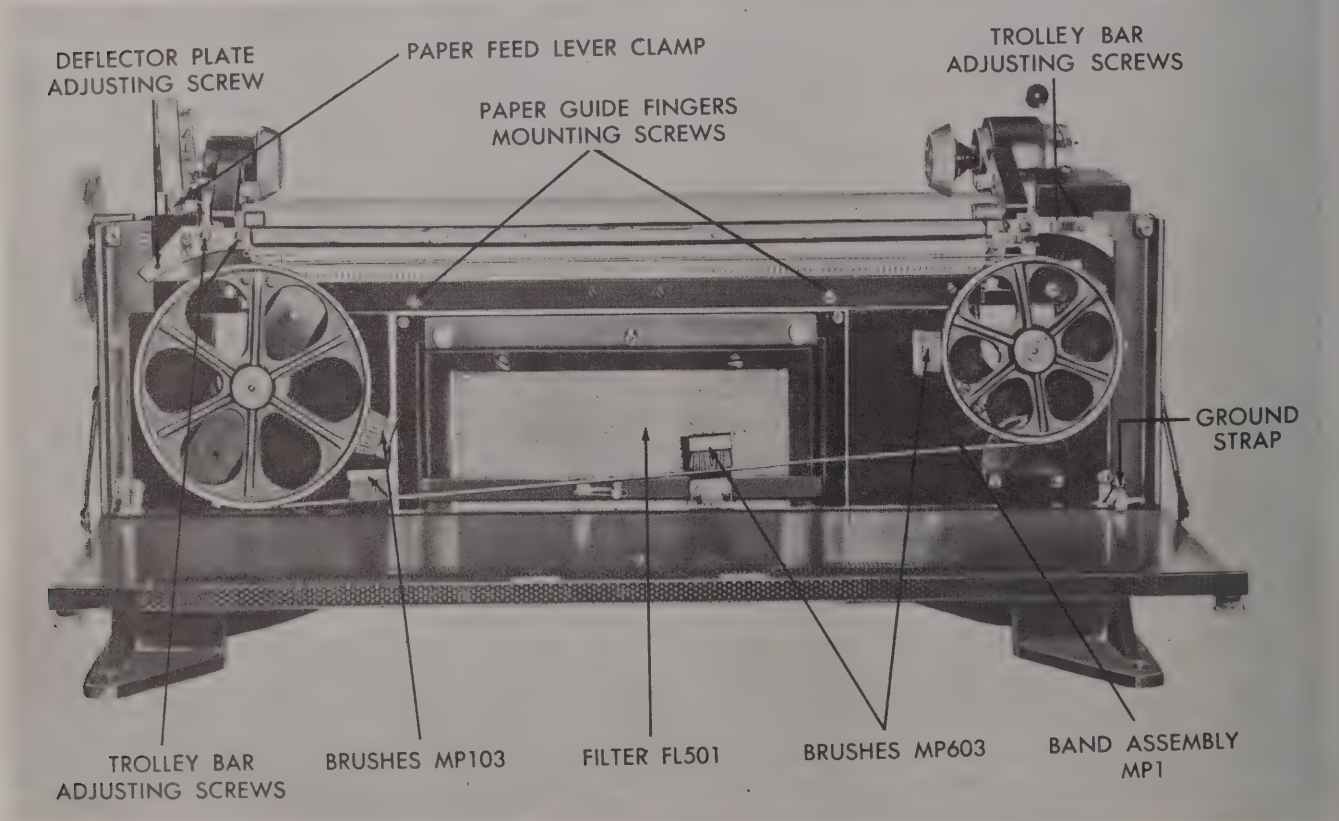


Figure 6—5. Recorder, Facsimile RO-76/UXH-2, Front View

(1) ADJUSTING THE TROLLEY BAR.—The trolley bar is supported by two screws through the nylon blocks at each end. These screws should not normally be disturbed, but if the position of the trolley bar needs adjustment, they may be loosened to permit lowering or raising it.

(*a*) Turn the equipment on up to RUN and press the STEADY test switch to record a few lines. Examine the copy.

(*b*) Turn the selector switch to STAND BY, open the equipment and lower the mech unit cover.

(*c*) If the left hand side of the recording shows bad grouping, loosen the two mounting screws holding the trolley bar to the left mounting bracket and tap the bar down slightly.

If the right hand side shows bad grouping, loosen the mounting screws on the right side and tap the right side of the bar down slightly.

(*d*) Tighten the mounting screws and check the copy by recording a few more lines of steady signal.

CAUTION

The nominal distance from the under side of the trolley bar to the top of the wheel is 3/8 of an inch. No adjustment should result in a change greater than 3/64 from this figure. Note, too, that any adjustment must still maintain parallelism between the trolley bar and the wheels. An inspection of the behavior of each stylus bushing traversing the length of the trolley bar should be made to determine if this parallelism has been achieved. Check also that the two screws that fasten the leaf to the nylon blocks do not rub on the trolley bar undersurface.

(2) REPLACING THE TROLLEY BAR.—If a trolley bar has become bent or damaged in any way to prevent a smooth traverse of the stylus holder assemblies, the trolley bar assembly (MP119) should be replaced as a complete unit, including the run-on and run-off curves (nylon pieces at the right and left side, respectively, of the trolley bar) and the three .0001 mf 1000-volt ceramic capacitors C505, C506, and C507. The deflector plate, which is mounted to the trolley bar, comes off the equipment with the trolley bar, but the deflector plate is not part of, and should be separated from, the trolley bar assembly. Paragraph 4*e* describes how to replace the deflector plate itself.

(*a*) Turn the equipment off and open the cabinet and the mech unit cover.

(*b*) Remove the band (see paragraph 3—6*d*).

(*c*) Loosen the 6-32 x 3/8 binding head screw and 6-32 hex nut mounting the far left end of the trolley bar assembly to the run-on curve and remove the wire print lead.

(*d*) Take out the two 6-32 x 1 binding head screws and No. 6 split washers that mount each side of the trolley bar assembly to the mounting blocks at each end through the nylon run-on and run-off curves, and remove the trolley bar assembly and deflector plate carefully to clear the paper guide fingers.

(*e*) Take the deflector plate together with the two deflector plate springs off the old trolley bar assembly and mount them onto the new trolley bar as described in paragraph 6.3—4*e*(2).

(*f*) Carefully position the new trolley bar assembly, line up the mounting holes, insert the mounting screws and tighten.

(*g*) Loosen the hex nut on the screw mounting the far left end of the trolley bar to the run-on curve and reconnect the electrical lead with the lug tab located at the top of the screw.

(*h*) Replace the stylus band (paragraph 3—6*d*) and check the position of the trolley bar as described in paragraph 4*d*(1) above.

e. DEFLECTOR PLATE (MP99) (figures 4—10, 6—5).—The deflector plate serves to lift the stylus needles over the left edge of the recording paper. A full-length stylus should first contact the deflector plate at a point between 3/16 and 3/4 of an inch from the left edge of the plate. If the deflector plate is out of position, it may bend the stylus needles to cause jitter or line grouping in the recorded copy.

(1) ADJUSTING THE DEFLECTOR PLATE POSITION.

(*a*) Remove all the stylus needles from the band and insert a new stylus (full length) in any one of the three holders (paragraph 3—6*a*).

(*b*) Slowly rotate the band clockwise until the new stylus needle approaches the deflector plate. Observe where the stylus needle first contacts the plate. This should be between 3/16 and 3/4 of an inch from the left edge of the plate.

(*c*) The screw mounting the left hand side of the deflector plate to the run-on curve (figure 6—5) adjusts the position of the point the stylus needle first contacts the deflector plate. Insert a small screw driver in the screw hole from the front and engage the slot in the front threaded end of the screw. Turn the screw counterclockwise to move the position of contact closer to the edge — clockwise to move it away from the edge.

(*d*) The screw mounting the right hand side of the deflector plate to the run-on curve adjusts the distance between the right hand edge of the deflector plate and the drum or paper. Adjust the screw as above until the rear face of the plate just clears the surface of the paper around the drum. The deflector plate must also clear the sync arm. Turn the sync arm *clockwise only* to make sure it does not catch on the front edge of the deflector plate.

(2) REPLACING THE DEFLECTOR PLATE OR DEFLECTOR PLATE SPRINGS.—The deflector plate is mounted to the trolley bar by a 4-40 x 1/2 binding head screw (H534) and a 4-40 x 5/16 binding head screw (H533), both used to adjust the deflector plate

position (see paragraph 6.3–4*e*(1). To replace the deflector plate, the trolley bar assembly must be removed from the mech unit and the deflector plate taken off the assembly from the rear.

(*a*) Remove the trolley bar assembly from the mech unit as described in paragraph 6.3–4*d*(2).

(*b*) Remove the longer 4-40 x ½ binding head screw (H534) on the right (looking at the trolley bar assembly from the rear) and the 7/32-inch long spring (MP101) mounted on the screw between the deflector plate and the run-on curve.

(*c*) Remove the shorter 4-40 x 5/16 binding head screw (H533) on the left (looking at the trolley bar assembly from the rear) and the 13/64-inch long spring (MP100) mounted on the screw between the deflector plate and the run-on curve.

When replacing the deflector plate make sure the longer spring is on the longer screw in the right hand mounting hole (looking at the assembly from the rear) and that the brightly polished side of the deflector plate is facing the front of the trolley bar and the two mounting tabs point upward. Mount the trolley bar assembly back onto the mech unit and check both the trolley bar position as described in paragraph 6.3–4*d*(1) and the adjustment of the deflector plate as described in 6.3–4*e*(1).

f. PAPER GUIDE SPRING (MP98) (figure 6–5).– If a paper guide finger is bent out of shape, the paper guide spring assembly may be repaired or replaced to ensure proper feeding of the paper. A screw driver with "screw-holding" facilities will simplify this operation.

(1) Remove the band assembly (paragraph 3–6*d*).

(2) Remove the two 6-32 x ⅜ binding head screws and No. 6 external lock washers mounting the paper guide spring assembly to the mech unit; but do not take out the glyptalled (red) screws.

(3) Slide the paper guide spring assembly to the right behind the right-hand wheel and then to the left out in front of the left-hand wheel. (If the sync arm interferes move it *clockwise only* to get sufficient clearance for the paper guide fingers.)

(4) Slide the paper guide spring assembly out from behind the wheels, moving it to the right and beneath the trolley bar. If possible, straighten bent fingers or break them off neatly.

(5) Carefully insert the repaired or replacement paper guide spring assembly from the right side behind the wheels and beneath the trolley bar. The folded tips of the fingers should point away from the drum. Do not use force or damage the fingers.

(6) Position the paper guide spring assembly so that the mounting holes line up with the screw holes in the mounting brackets. Insert the mounting screws and lock washers and tighten.

(7) Replace the right hand side wall assembly.

(8) Replace the band assembly.

Check that none of the stylus needles interfere with the paper guide fingers by carefully rotating the band *clockwise only* by hand, (equipment in STAND BY condition). If there is interference, the paper guide fingers must be lowered.

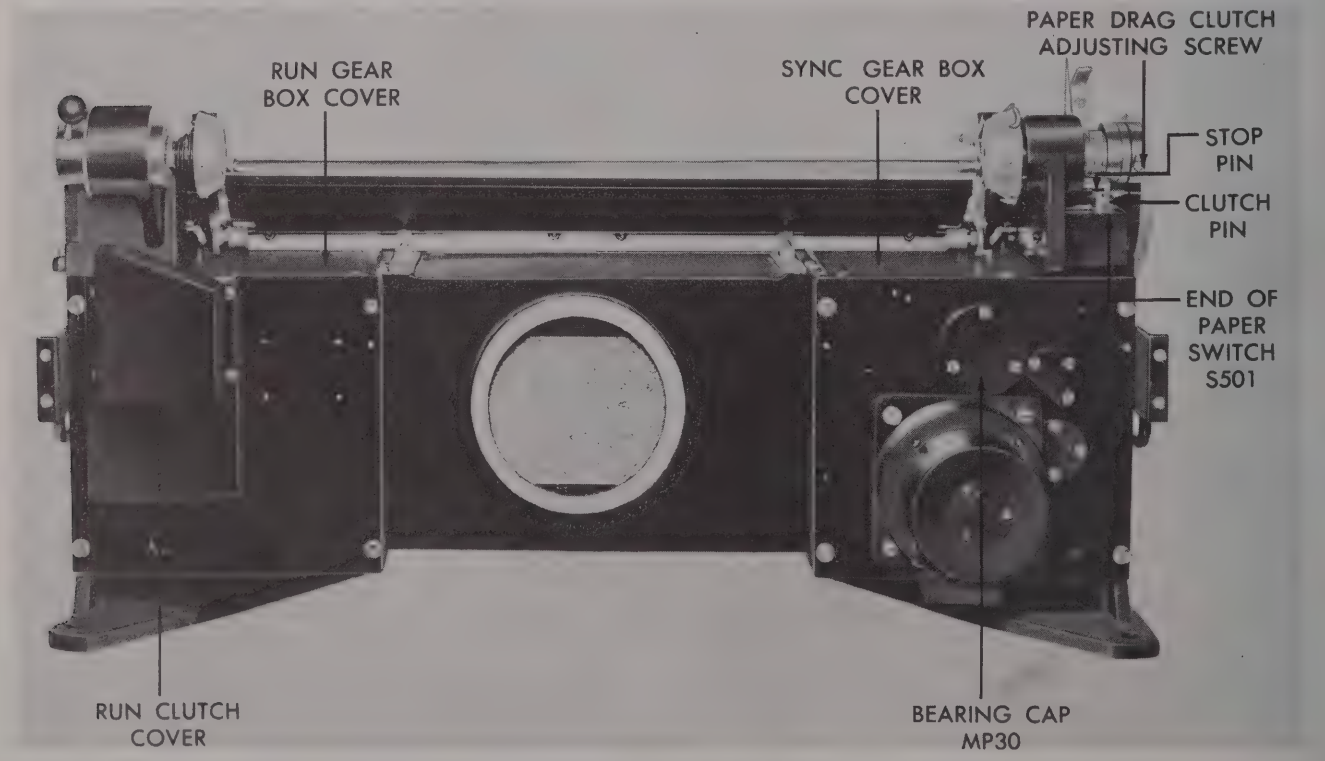


Figure 6–6. Recorder, Facsimile RO-76/UXH-2, Rear View

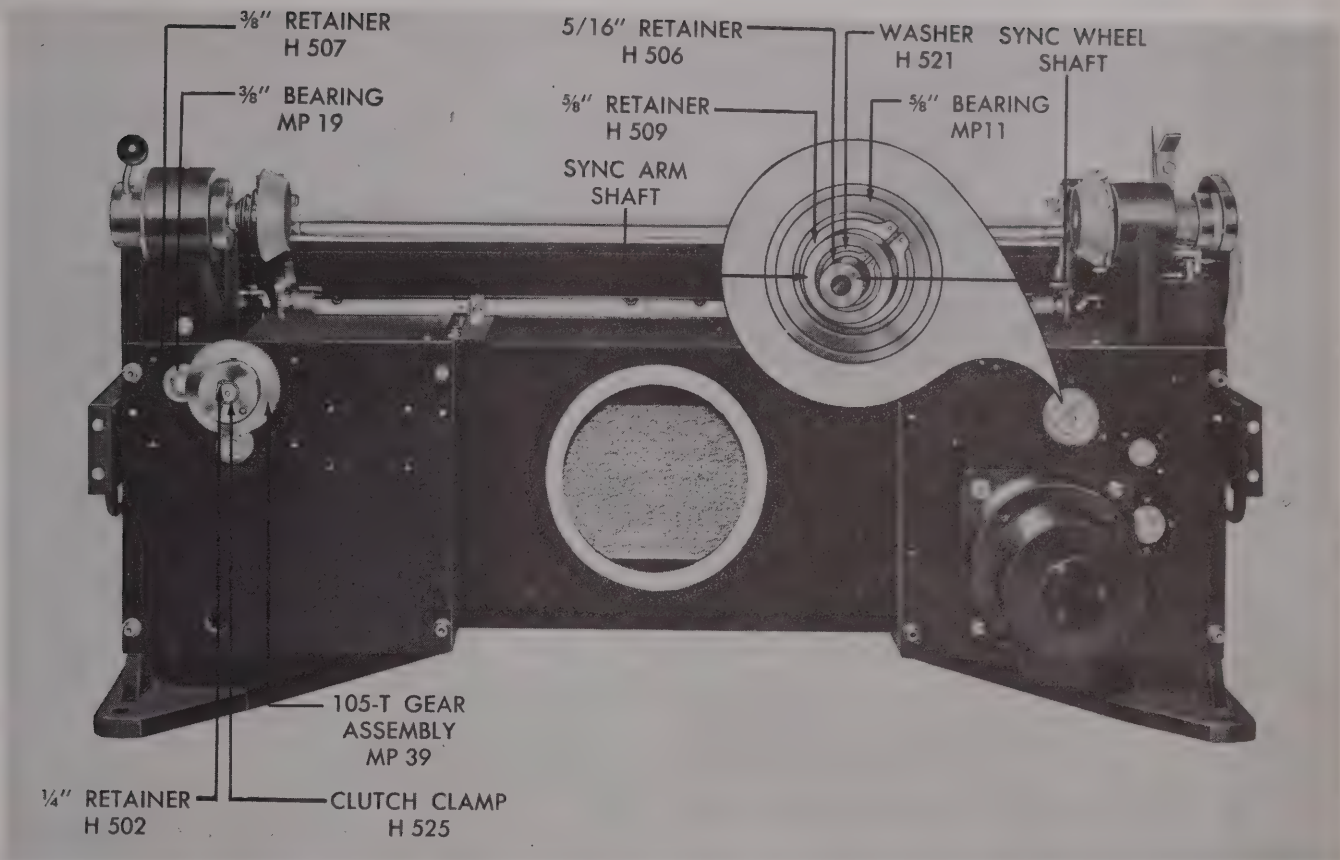


Figure 6—7. Recorder, Facsimile RO-76/UXH-2, Rear View, Covers Removed

g. RUN SLIP CLUTCH (figures 6—7, 6—8, 6—9).— The clutch at the rear of the run shaft should slip only after a certain load is exceeded. If the clutch is too loose, the run system will not be able to drive the stylus needles at sync speed, and the recorded copy will be skewed or unintelligible. If too tight, the sync motor may occasionally knock out of synchronism on impact (the "catch-up" at the start of a new copy). This may result in an occasional out-of-phase recording, or, when the condition is severe, the completely unintelligible copy resulting from non-synchronous operation.

(1) ADJUSTING THE RUN SLIP CLUTCH.

(*a*) Remove the mech unit from the cabinet (paragraph 4*a* above).

(*b*) Remove the run clutch cover (figure 6—6) by taking out the four 6-32 x 1/4 binding head screws and No. 6 external lock washers.

(*c*) To increase the clutch tension, loosen the lock screw in the slip clutch adjusting nut and advance the nut toward the gear box.

To decrease the clutch tension, loosen the lock screw in the slip clutch adjusting nut and back the nut away from the gear box.

(*d*) The correct tension on the run slip clutch is a force of approximately 16 ounces on the periphery of the run wheel. Tighten the lock screw in the clutch adjusting nut. Tie a string around the run wheel and, holding the clutch gear stationary, measure with a spring scale the force necessary to turn the run wheel shaft. Readjust if necessary per step (*c*) above.

(2) REMOVAL AND DISASSEMBLY OF THE RUN SLIP CLUTCH (figure 6—8).

(*a*) Remove the mech unit from the cabinet (paragraph 6.3—4*a*).

(*b*) Remove the run clutch cover by taking out the four 6-32 x 1/4 binding head screws and No. 6 external lock washers.

(*c*) Remove the 1/4-inch retainer ring (H502) from the rear of the run shaft and slip the run clutch assembly off the shaft.

(*d*) Loosen the 6-32 x 3/8 socket head cap screw in the clutch clamp.

(*e*) Unscrew the clutch clamp (H525) from the hub (MP37). The pressure plate assembly (MP38), the 105-tooth gear assembly (MP39) and the thrust spring (MP36) separate from each other.

When reassembling the run clutch, make sure the dowel pin of the pressure plate assembly is facing away from the 105-tooth gear.

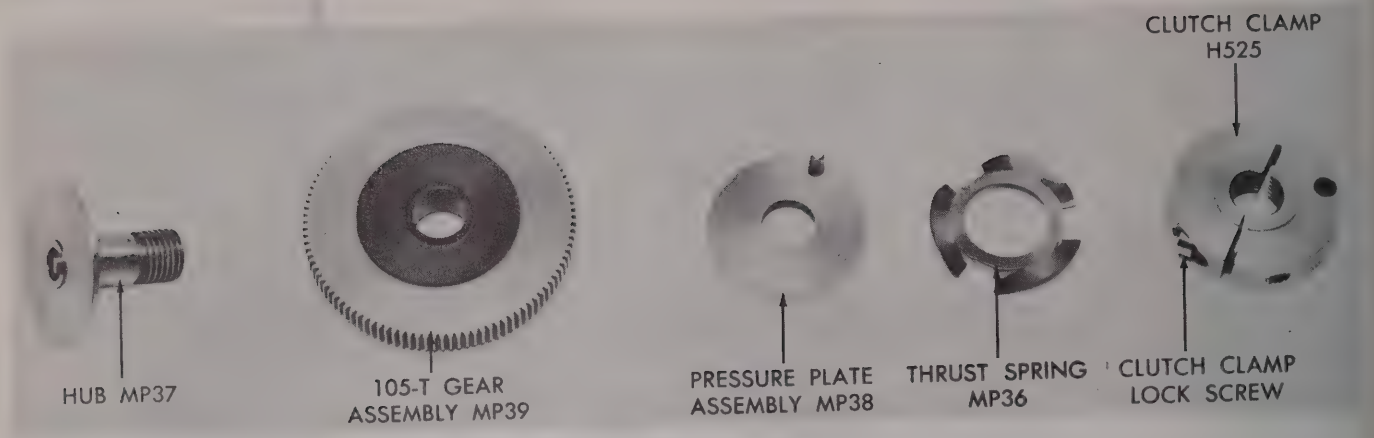


Figure 6–8. Run Slip Clutch, Exploded View

b. RUN GEAR BOX (figure 6–9).–To gain access to any of the run gears, run motor, or run and start motor capacitors, C503 and C504, the run gear box must be removed from the mech unit. The cabling will permit the run gear box to be taken off the mech unit without disturbing the connections, but if the run motor or a capacitor needs repair, the leads will have to be disconnected as described below.

(1) Remove the mech unit from the cabinet (paragraph 6.3–4*a*) and remove the band (paragraph 3–6*d*).

(2) Remove the run slip clutch from the run wheel shaft as described in paragraph 6.3–4*g*(2).

(3) Remove the run gear box cover by taking out the two 6-32 x 1/4 binding head screws and No. 6 external lock washers which mount it to the run gear box casting.

(4) Take out the 8-32 x 3/8 binding head screw and No. 8 split washer mounting the cable clamp to the rear of the run gear box (figure 6–6), but the clamp may be left on the cable.

(5) Take off the 3/8-inch retainer ring (H507) from behind the ball bearing (MP19) at the rear of the run wheel shaft and pull the run wheel, shaft and 27-tooth gear assembly (MP35) out from the front of the mech unit. Another 3/8-inch bearing (MP19) is captured on the run wheel shaft between the run wheel and the 27-tooth gear. If this bearing has to be replaced or removed for any reason, it is necesary to knock out the 1/16 x 1/2 roll pin in the hub of the 27-tooth gear, slip the gear and then the bearing off the shaft. The 27-tooth gear, however, is not independently replaceable, and if defective must be replaced as part of the run wheel, shaft and 27-T gear ass'y (MP35).

(6) Remove the run gear box by taking out the three 10-32 x 7/8 socket head cap screws, No. 10 flat washers and No. 10 split washers and one 10-32 x 5/8 socket head cap screw and No. 10 flat washer. When reassembling the run gear box onto the base casting note that the short screw without the flat washer is used in the counterbored hole mounting the gear box to the mech unit casting. Carefully take the gear box out by pulling it back off its locating pins and dropping the whole assembly down to clear the paper feed gears.

(7) To remove capacitor C503 or C504, disconnect the leads to the capacitors as shown in table 6–10, and loosen the four clamps holding the capacitors to the gear box.

(8) To remove the run motor (B502), disconnect the four leads from the terminals at the bottom of the motor (refer to table 6–10) and take out the four 8-32 x 5/8 socket head cap screws, No. 8 flat washers and No. 8 split washers mounting the run motor to the gear box.

TABLE 6–10. MECH UNIT CABLE CONNECTIONS TO RUN MOTOR AND RUN AND START MOTOR CAPACITORS C503 AND C504

COLOR CODE	TERMINAL NUMBER
black/white	C503 – 1
black/white	C503 – 2
black/red	C504 – 1
black/red	C504 – 1
white	C504 – 2
gray/green	run motor – 1
gray/green	run motor – 2
black/white	run motor – 3
gray/black	run motor – 4

(9) To take the 32-tooth gear (MP34) off the run motor shaft, remove the 6-32 x 3/16 socket head cup point set screw in the hub of the gear.

(10) Remove the 3/8-inch retainer ring (H507) from the back of the shaft of the 90-T and 28-T gear assembly (MP33).

(11) Take off the run gear box plate by removing the three 8-32 x 1 and one 8-32 x 5/8 (where the plate is rounded off) socket head cap screws, four No. 8 split washers and three No. 8 flat washers. Note when reassembling that the short screw is inserted in counterbored hole with a split washer but no flat washer.

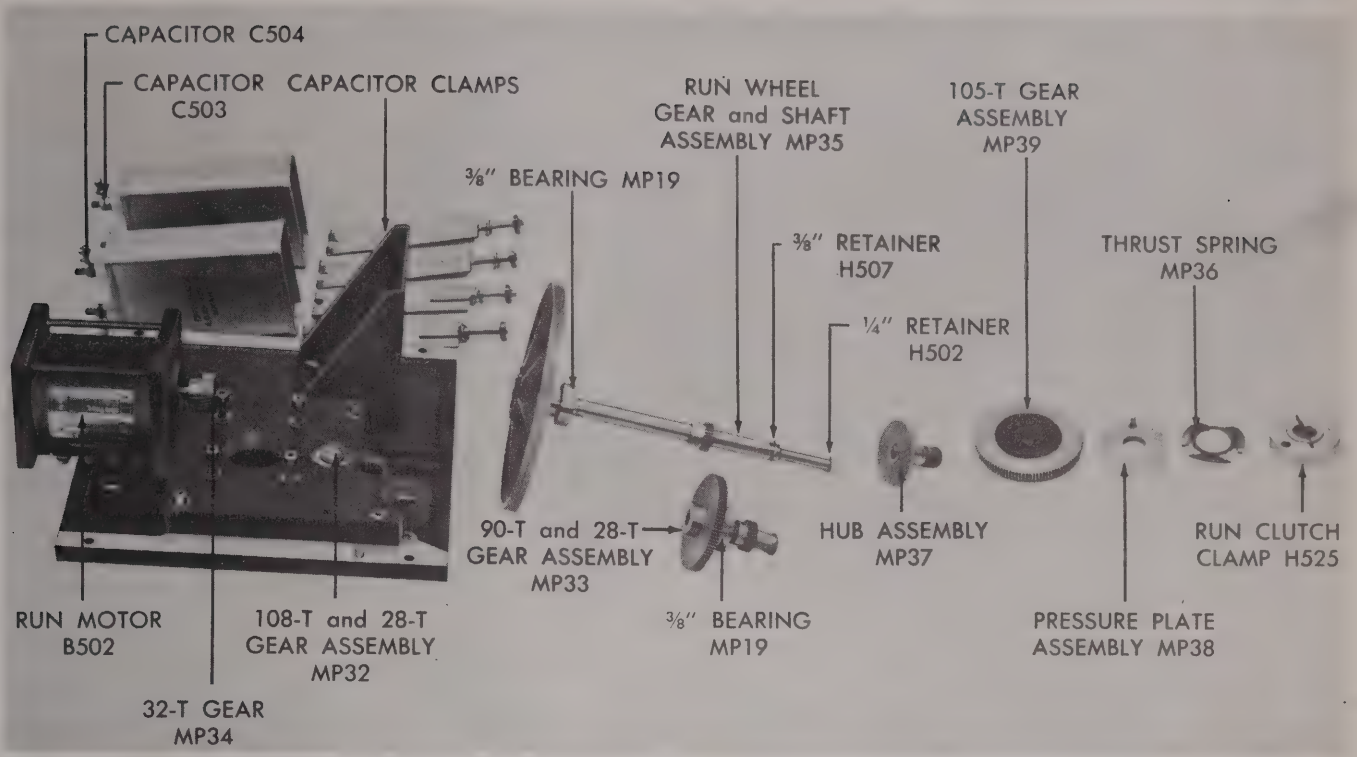


Figure 6–9. Run Gear Box, Disassembled

(12) The 90-T and 28-T gear assembly (MP33) will slip out of the hole in the run gear box plate casting with the ⅜-inch bearing (MP19) captured on the shaft between the 28-T gear and a ⅜-inch retainer ring (H507). If this bearing needs replacement, it will be necessary to disassemble one of the gears from the shaft by knocking out the 1/16 x 1/2 roll pin that holds the 28-tooth gear to the shaft or the 1/16 x 5/8 roll pin that holds the 90-tooth gear to the shaft and take off the 3/8-inch retainer ring (H507) in the groove on the shaft between the 90-tooth gear and the bearing. If either the 90- or 28-tooth gear is defective, it must be replaced as a complete 90-T and 28-T gear assembly (MP33). If this assembly is replaced, one of the new gears will have to be taken off the shaft as described above so that the 3/8-inch retainer ring (H507) and the ⅜-inch bearing (MP19) may be placed on the shaft before reassembling into the run gear box plate.

(13) To remove the 108-helical and 28-tooth gear assembly (MP32), take off the ⅜-inch retainer ring (H507) from in front of the plate and push the shaft through the ⅜-inch bearing (MP19) in the run gear box plate casting out towards the rear of the plate, with another ⅜-inch bearing (MP19) captured on the shaft between the 108-tooth gear and a ⅜-inch retainer (H507). Similar to the 90-T and 28-T gear arrangement mentioned in step (12) above, if this bearing needs replacement, it will be necessary to disassemble one of the gears from the shaft by knocking out the 1/16 x 5/8 roll pin that holds the 108-tooth gear to the shaft or the 1/16 x 1/2 roll pin that holds the 28-tooth gear to the shaft and taking off the ⅜-inch retainer ring (H507) in the groove on the shaft between the 28-tooth gear and the bearing. If either the 108- or 28-tooth gear is defective, it must be replaced as a complete 108-T and 28-T gear assembly (MP32). If this assembly is replaced, one of the new gears will have to be taken off the shaft as described above so that the ⅜-inch retainer ring (H507) and the ⅜-inch bearing (MP19) may be placed on the shaft before reassembling into the run gear box plate.

i. SYNC GEAR BOX (figures 6–10 through 6–12). —It is necessary to take the sync gear box off the mech unit to gain access to the phase actuator, the phasing clutch, the flywheel or any of the sync gears. A "screw-holding" screw driver, light hammer and pin punch are needed.

(1) Remove the mech unit from the cabinet (paragraph 4*a* above) and take off the band (paragraph 3–6*d*).

(2) Take out the 8-32 x ⅜ binding head screw and No. 8 split washer mounting the cable clamp to the rear of the sync gear box (figure 6–6), but the clamp may be left on the cable.

(3) Take off the sync wheel shaft cover plate (⅝-inch bearing cap MP30) (figure 6–6) by removing the three 6-32 x ½ binding head screws and No. 6 external lock washers.

(4) Remove the 5/8-inch retainer ring (H509) from the rear of the sync wheel shaft (figure 6–7).

(5) Remove the sync gear box cover by taking out the two 6-32 x 1/4 binding head screws and No. 6 external lock washers.

(6) Take out the four 10-32 x 7/8 socket head cap screws, No. 10 flat washers and No. 10 split washers mounting the sync gear box to the mech unit casting and carefully pull the sync gear box off its locating pins and away from the rear of the casting.

With the sync box removed from the mech unit, the flywheel and sync clutch pawl springs, and the phase magnet are accessible without further dismantling the sync gear box. Paragraph 4*j* describes repairs to the phase actuator; paragraphs 4*k* and 4*l*, to the flywheel and sync clutch pawl springs; and paragraph 4*m*, to the sync motor. The following steps in this paragraph describe removal of the other sync components.

(7) To dismantle the sync shaft (figure 6—10):

(*a*) Remove the 5/16-inch retainer ring (H506) and spacer (H521) at the rear of the shaft and pull the sync wheel and inner sync shaft assembly (MP28) out towards the front of the mech unit.

(*b*) Take off the two 5/8-inch retainer rings (H509) from the rear of the shaft.

(*c*) Loosen the 10-32 x 1 socket head cap screw and remove the dog latch hub assembly (MP13) with the dog latch (MP14) (sometimes called the "phasing pawl") and spring (MP15) on it. The dog latch is held in place on the hub by, and pivots on, dog latch screw (H518). One end of the spring hooks into the spring anchor of the hub assembly and the other end hooks into a hole in the dog latch.

(*d*) Remove the two 5/8-inch retainer rings (H509) and slip the entire sync clutch assembly off the shaft. See step (8) below for instructions on dismantling the sync clutch.

(*e*) Push the rear of the sync arm shaft towards the front of the mech unit and remove the sync arm and shaft assembly (MP10) with the 5/16-inch flanged bearing (MP29) inside the front of the shaft, the 5/8-inch bearing (MP11), the bowed 5/8-inch retainer ring (H510) and straight 5/8-inch retainer ring (H509) on the shaft behind the arm. Remove the bearing (MP11) by taking off the bowed ring (H510). When reassembling the bearing (MP11) onto the sync arm shaft, make sure the bowed ring is put on the side of the bearing away from the sync arm.

(8) To dismantle the sync clutch assembly (figure 6—11):

(*a*) Take out the three 4-40 x 1/4 flat head screws and remove the brass retainer plate (flat washer H515).

(*b*) Take the two 5/8-inch bearings (MP1) out from inside the clutch hub.

(*c*) Lift off the bronze hub with the clutch stop arm (MP31), the sync ratchet pawl assembly (MP16), the pawl spring (MP17), the pawl spring retainer (H516), shoulder screw (H517) and pawl spring retainer screw (H519) mounted thereon. The stop arm (MP31) is fastened to the hub with two 6-32 x 7/16 binding head screws and No. 6 split washers. The pawl spring retainer (H516) is held to the hub by pawl

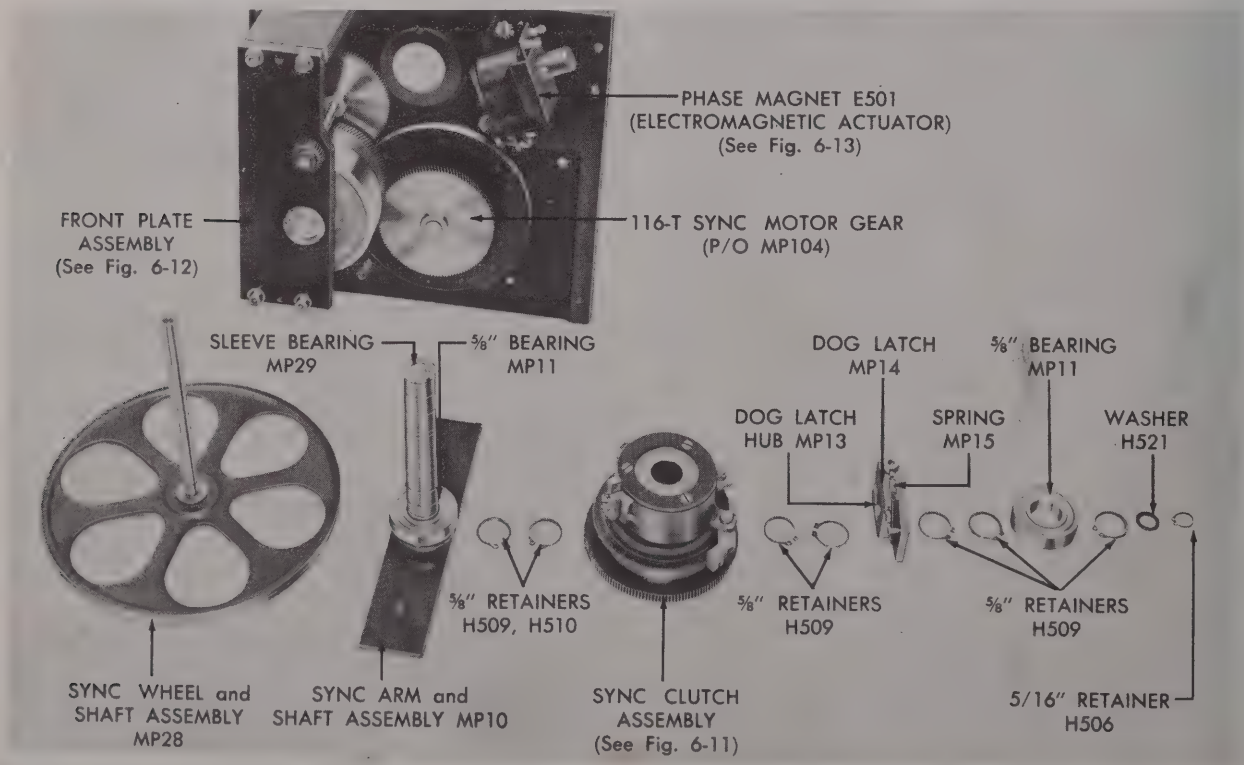


Figure 6—10. Sync Gear Box, Exploded View of Sync Shaft Assembly

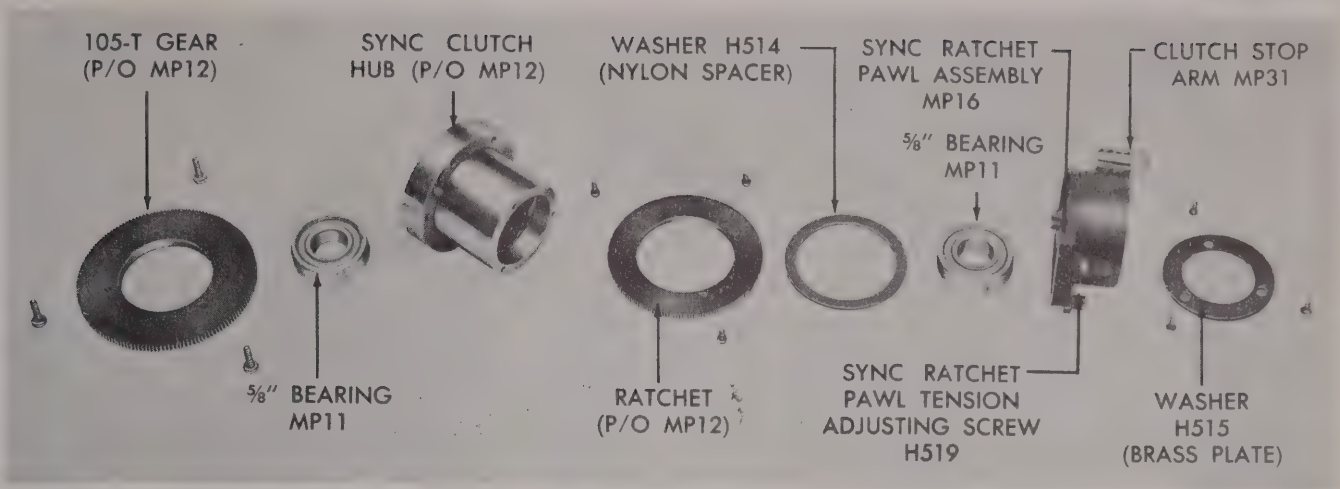


Figure 6—11. Sync Clutch Assembly, Exploded View

spring retainer screw (H519) and a No. 4 flat washer and No. 4 split washer. The pawl spring (MP17) is held to the retainer by a 2-56 x 1/8 round head screw and No. 2 split washer. The pawl assembly (MP16) is held in place by, and pivots on, shoulder screw (H517) (with a No. 6 split washer and No. 6 hex nut) so that the unweighted end of the pawl presses against the spring.

When reassembling these parts, check the tension on the pawl spring as described in paragraph 6.3—4*l*.

(*d*) Take off the nylon spacer (flat washer H514).

(*e*) Take the 1 3/8-inch internal straight (H512) and bowed (H513) retainer rings out from inside the clutch hub. Note when reassembling that the bowed retainer ring goes in the wider groove.

(*f*) The remaining piece, the sync clutch hub assembly (MP12) (including the 100-tooth ratchet, 105-tooth gear, and the clutch hub) must be replaced as a complete assembly (MP12).

→ (9) Take out the four 8-32 x 3/4 socket head cap screws, No. 8 split and No. 8 flat washers holding the sync gear box front plate to the gear box casting and pull off the front plate with the flywheel and 116-tooth helical gear shaft and the 30- and 108-tooth gear shaft attached.

(10) It is necessary to disassemble the 30-T and 108-T gear assembly (MP20) in order to remove or disassemble the flywheel shaft, or to replace the 1/4-inch bearing (MP18) near the 30-tooth gear. But the 30-tooth gear or 108-tooth gear may not be replaced independently. If either gear is defective, a complete new 30-T and 108-T gear assembly (MP20) must be replaced. To take this assembly off the front plate, knock out the 7/0 x 1/2 taper pin in the hub of the 30-tooth gear, slide the gear off the shaft and pull the 108-tooth gear and shaft out from back of the front plate. A bowed 1/4-inch retainer ring (H503) holds the bearing (MP18) in place near the 30-tooth gear.

When replacing this assembly onto the front plate, or when installing a new assembly, it is necessary to take the 30-tooth gear off the shaft as described above, slip the bowed 1/4-inch retainer ring (H503) into the groove on the shaft, slip the 1/4-inch bearing (MP18) on the shaft, insert the shaft through the 5/8- inch diameter hole in the front plate and then replace the 30-tooth gear with the 7/0 x 1/2 taper pin. Make sure the bowed 1/4-inch retainer ring (H503) is in the wider groove on the shaft (near the 30-tooth gear).

(11) Pull the flywheel assembly shaft from the gear box plate and disassemble as follows: (The two 3/8-inch bearings (MP19) at the ends of the flywheel assembly shaft may come off with the shaft or may stay in the holes in the front plate and sync gear box castings.)

(*a*) Remove the 3/8-inch retainer ring (H507) and spacer (flat washer H520) from in front of the flywheel assembly.

(*b*) Remove the flywheel assembly from the shaft, being careful not to alter the pawl and spring adjustment. Do not deform the spring in any way. (See step (13) below for instructions on how to dismantle the flywheel assembly, and paragraph 4*k* below for adjustment of the pawl and spring tension.)

(*c*) Remove the spacer (H520) and 3/8-inch retainer ring (H507) from behind the flywheel.

(*d*) Remove the 100-tooth ratchet (MP42) by taking out the three 4-40 x 1/4 flat head screws holding it to the coupling pin hub. (The ratchet may be replaced independently or as part of the ratchet, hub and gear assembly (MP22) mentioned in step (*e*)).

(*e*) The ratchet, hub and gear assembly (MP22) (including the ratchet, coupling pin, coupling pin hub, 54-tooth gear and shaft) must be replaced as a complete unit, but the 116-tooth helical gear and bearing assembly (MP21) is a separate component and should be replaced independently if defective. To remove the 116-tooth helical gear and bearing assembly from the shaft,

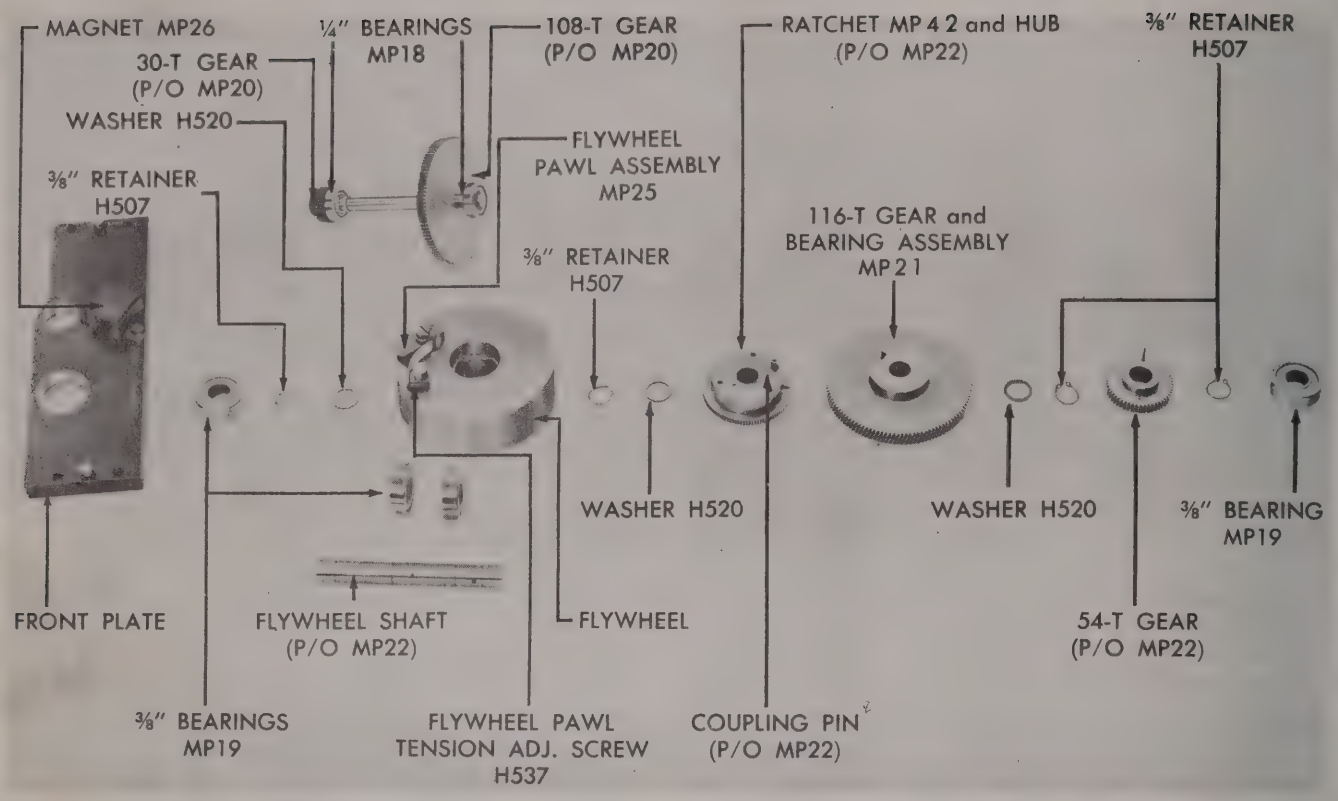


Figure 6—12. Sync Gear Box, Front Plate Assembly, Exploded View

knock out the 1/16 x 5/8 roll pin in the hub of the 54-tooth gear and slip the gear, 3/8-inch retainer ring (H507) and two spacers (H520) off the shaft; or knock the 1/8 x 1 1/4 roll pin out of the coupling pin hub and slip the ratchet and hub and two spacers (H520) off the shaft.

When replacing the 116-tooth gear and bearing assembly (MP21) and reassembling the ratchet, hub and 54-tooth gear assembly (MP22), make sure the coupling pin is in the cut-out portion of the 116-tooth gear hub.

(12) The flywheel pawl assembly (MP25) is held to the flywheel (MP24) with, and pivots on, an 8-32 x 1/2 fillister head screw with a No. 8 split washer, washer (H526) and spacer (H538). The pawl spring retainer (H536) is held to the flywheel by the retainer screw (H537) and No. 4 external lock washer, and the spring to the retainer by a No. 2-56 x 1/8 round head screw and No. 2 split washer.

When reassembling make sure the tension on the pawl spring is as described in paragraph 4*k*.

(13) To remove the flywheel magnet (MP26), loosen the 6-32 x 3/4 round head screw and slip the magnet out of the magnet clamp.

When reassembling the sync gear box, the magnet should be as close to the flywheel as possible without touching it (a gap of approximately .003 inch or the thickness of a piece of paper). If necessary to readjust the position of the magnet, loosen the center magnet clamp screw, tap the magnet into place and tighten the screw. It may be necessary to loosen the two side screws holding the magnet mounting plate to the gear box front plate in addition to the center screw to get more movement of the magnet.

j. PHASE ACTUATOR (E501) (figure 6—13).—Improper phasing may be caused by a defective phase actuator, or merely by the armature of the phase actuator being out of adjustment and not having the proper movement. The sync gear, box must be removed from the mech unit casting to make any adjustments or repairs to the phase magnet, and a .023-inch feeler gauge is necessary to adjust the armature position.

(1) CHECKING THE ARMATURE ACTION.

(*a*) Test the return spring (MP112). It should produce a strong, snappy action. If the tension is weak, replace the spring. The eye-terminal of the spring is pinned to the armature, the other end hooks onto the back-stop frame.

(*b*) Make sure the adjustable and fixed pivots do not cause binding or permit side play of the armature. If necesary, tighten or loosen the lock nut on the adjustable pivot (H541) and tighten or loosen the pivot so that the armature moves freely with little or no side play.

(2) ADJUSTING THE ARMATURE POSITION. —Use a .023-inch feeler gauge and adjust the air gap between the contact point on the armature and the core of the coil to .023 inch by loosening the lock nut on the

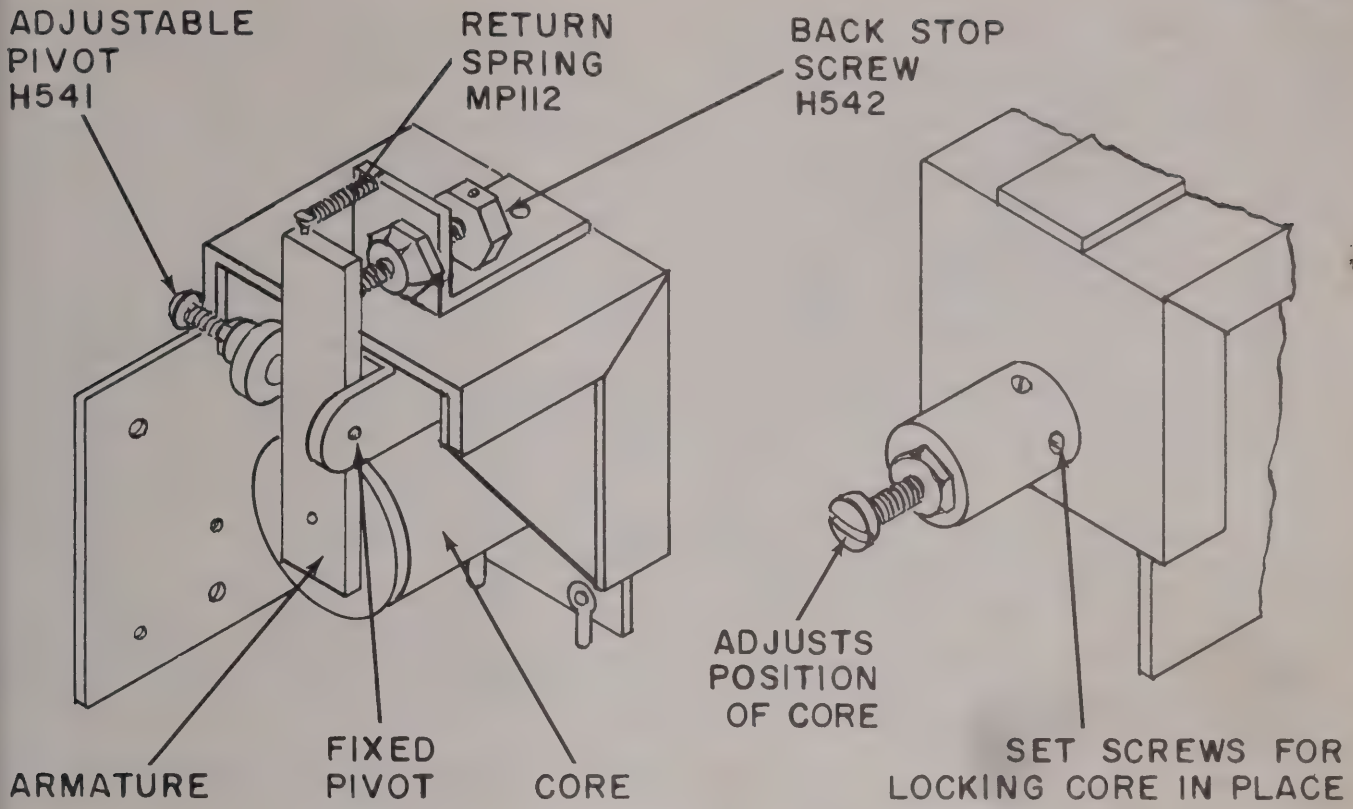


Figure 6—13. Phase Magnet Assembly

back-stop screw (H542) and advancing or backing off the screw. Do not touch the set screw or move the coil assembly.

If the gap measures nearly .023 inch when originally checked, but the phase actuator does not function properly, the remedy depends upon the original trouble symptom and the gap found before adjustment.

Assuming the gap is measured as normal, and the trouble symptom is that the copy is out of phase and the buzzing sound is heard for only a fraction of a second or no buzzing sound is heard at all at the start of a phasing period — set the gap .003 inch larger and recheck.

Assuming the gap is measured as normal, and the trouble symptom is that the buzzing sound is heard and continues to be heard when the selector switch is turned from STAND BY to START position — set the gap .003 inch smaller and recheck.

If either of the above .003 inch adjustments in the armature position has been necessary, the gap between the core and the armature contact point should be restored to .023 inch. Loosen the set screw locking the core in place and the lock nut on the coil core adjusting screw. To increase the gap .003 inch rotate the coil core adjusting screw approximately one-tenth of a turn clockwise; to decrease the gap .003 inch rotate the coil core adjusting screw one tenth of a turn counterclockwise. Tighten the set screw and lock nut.

If after checking the armature movement and position, as explained above, the phase actuator still does not function properly, it should be replaced with a factory-adjusted phase magnet assembly (E501).

(3) REPLACING THE PHASE ACTUATOR.

(*a*) Unsolder the yellow/orange lead to terminal No. 1 and the black lead to terminal No. 2 on the phase magnet.

(*b*) Remove the two 8-32 x 3/8 binding head screws and No. 8 external lock washers and pull the complete phase magnet assembly (E501) off its locating pins.

When replacing the unit, place the frame on the locating pins, secure the 8-32 x 3/8 screws and No. 8 lock washers and reconnect the leads. Check the .023-inch gap and the armature and spring action, as described above, before replacing the sync gear box.

k. FLYWHEEL PAWL SPRING TENSION.—If the recorded copy is out of phase or out of synchronism, the flywheel pawl spring tension may be incorrect. The force of the pawl on the ratchet should be light enough so that the pawl just hits each tooth of the ratchet. If it is necessary to readjust the tension, loosen the pawl spring retainer screw (H537) with a 1/16-inch diameter rod or similar size Allen-type key by inserting the rod in one of the two 1/16-inch diameter holes in the head and turning the screw enough to permit the spring retainer (H536) to rotate. Insert a similar rod in the hole in the spring retainer and rotate the retainer with the spring attached so as to increase or decrease

the tension on the spring as required. Tighten the retainer screw firmly.

l. SYNC CLUTCH PAWL SPRING TENSION.—Improper sync clutch pawl tension will also adversely affect phasing or synchronism. If the tension is too low, the recorder will phase repeatedly. If the tension is too high, the ratchet and pawl will wear out prematurely. The nominal force of the clutch pawl on the ratchet, measured at the tip of the pawl is 20 to 22 ounces. Measure the force necessary to raise the pawl from the ratchet with a string tied around the tip of the pawl and a spring scale.

Increase or decrease the clutch pawl spring tension in a manner similar to that described for the flywheel pawl spring tension in paragraph *k* above. Loosen the pawl spring retainer screw (H519) and rotate the spring retainer (H516).

m. SYNCHRONOUS MOTOR (B501) (figures 6—14 and 6—15).—A defective synchronous motor can be removed without completely disassembling the gear box.

(1) Remove the terminal shield by taking out the two 6-32 x 1/4 binding head screws and No. 6 external lockwashers fastening the shield to the sync motor housing.

(2) Unsolder the six leads to the sync motor terminal strip as described in table 6—11.

(3) To get the sync motor off the rear of the sync gear box, remove the four 8-32 x 5/8 binding head screws, No. 8 flat and No. 8 split washers mounting the motor frame to the gear box rear wall, and pull the sync motor together with the 116-tooth helical gear toward the rear of the mech unit out of the main casting.

Note

If this 116-tooth left hand helical gear is defective, it may be replaced as part of the motor shaft and gear assembly (MP104) or as part of the sync motor assembly, complete (B501), but it is not a replaceable item by itself.

(4) Take out the four 6-32 x 2 round head screws and No. 6 split washers holding the two bells of the motor together and separate the bells.

(5) Lift the sync motor shaft (p/o MP104) carefully out of the coil-end bell.

(6) If the 3/8-inch bearing (MP105) at the end of either bell is binding or defective in any way, it can be replaced by removing the three 4-40 x 1/4 binding head screws and No. 4 split washers that hold the bearing caps to the motor bell frames. In the rear bell assembly (the start stator bell), take off the bearing cap and thrust spring (MP107).

(7) If any of the sync motor coils are shorted or open, they should all be replaced as one complete string (E502) as follows:

(*a*) Unsolder the green leads to terminals 1 and 3, and the red leads to terminal 2, entering the terminal strip from the inside. Note carefully the position of each coil and the method of running the leads (figure 6—15). Pry each coil off its pole piece with care.

TABLE 6—11. MECH UNIT CABLE CONNECTIONS TO SYNC MOTOR

COLOR CODE	TERMINAL NUMBER
blue shielded	sync motor -1
red	sync motor -2
blue shielded	sync motor -3
black/red	(start motor) -4
gray/green	(start motor) -5
white	(start motor) -6

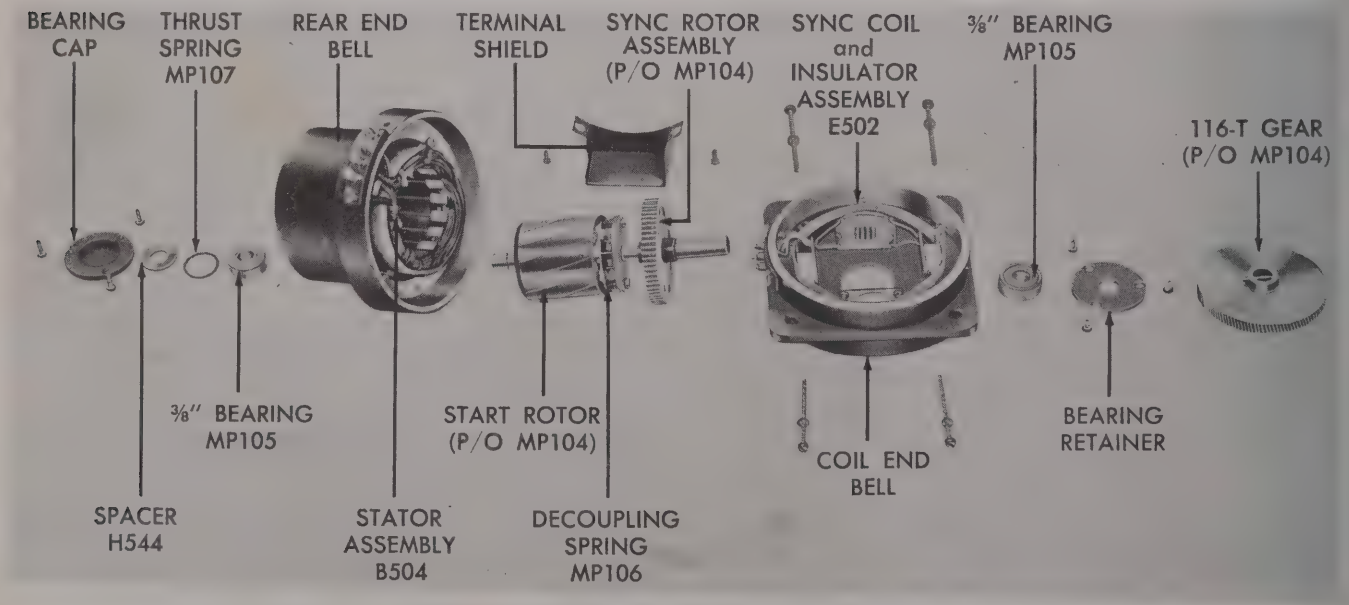


Figure 6—14. Sync Motor, Exploded View

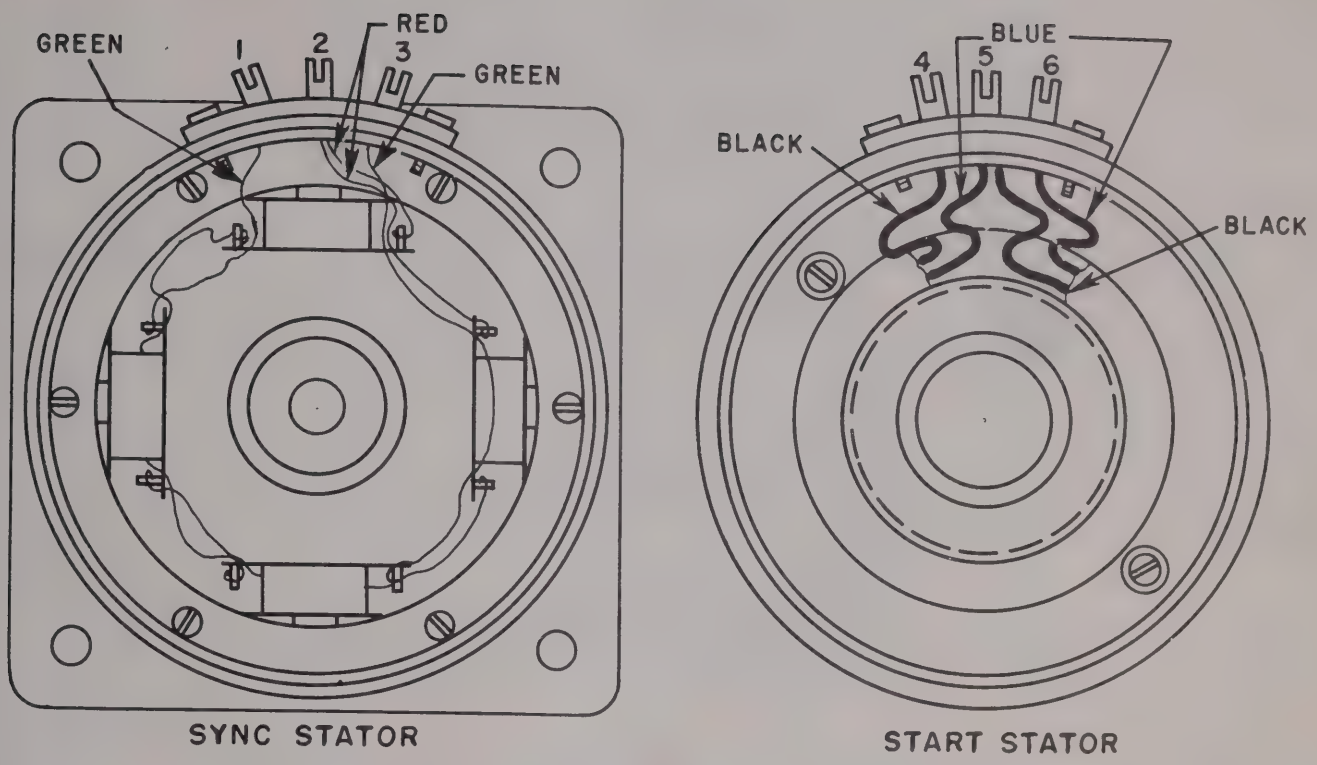


Figure 6–15. Sync Motor, Wiring Arrangement

(*b*) Examine the insulator, p/o E502, motor coil and insulator assembly, and replace if damaged.

(*c*) Press the new coil assembly in place in the same arrangement as the old one. Make sure the coils are pressed all the way back from the nose of the poles. If a coil fits loosely over the pole piece, insert a wooden wedge between the coil window and the pole.

(*d*) Carefully check the wiring (figure 6–15) and resolder the wires to the terminals as mentioned in table 6–11.

(8) To disassemble the sync motor shaft:

(*a*) Remove the two 3/8-inch retainer rings (H507) from the end of the sync motor shaft behind the start rotor assembly (B503) and slip the start rotor assembly off the shaft.

(*b*) Remove the 3/8-inch retainer ring (H507) from behind the decoupling plate assembly.

(*c*) The decoupling plate and sync rotor are not independently replaceable items. They are part of the sync motor and shaft assembly (MP104) and should be left on the shaft.

(*d*) The two each decoupling springs (MP106) and decoupling studs (H535) may be removed from the decoupling plate by unscrewing them from the two 6-32 x 3/8 screws in the decoupling plate.

When reassembling the sync motor shaft, replace the parts in the opposite order to that mentioned above, and when slipping the start rotor on the shaft, insert the roll pin on the start rotor through the hole in the decoupling plate. Replace the retainer ring (H507) in back of the rotor.

(9) To remove the start stator (B504) from the rear bell, unsolder the black lead to terminals 4 and 5 and the blue leads to terminals 5 and 6, entering the terminals from the inside, and unscrew the two 4-40 x 1/4 binding head screws and No. 4 internal lock washers holding the stator to the motor frame.

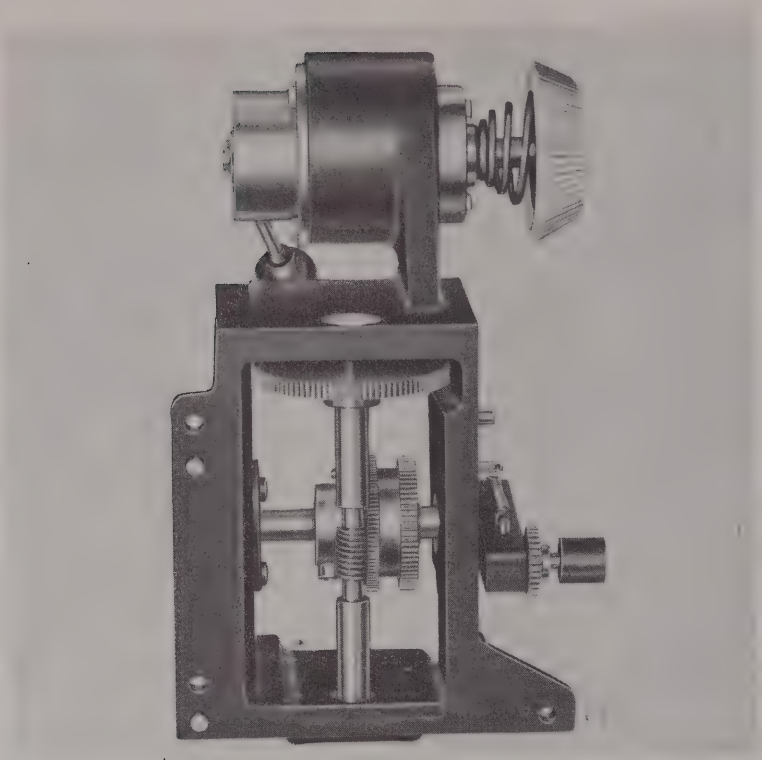
When reassembling the sync motor, insert the completely assembled sync shaft through the bearing in the coil-end bell.

When pressing the motor bells together, because of the very small air gap between the start rotor and start stator, it is necessary that the sync motor shaft be set in perfectly square.

Line-up the terminal strips when putting the two sections of the motor together and tighten the 2-inch screws sequentially until almost tight. It is imperative that only after they are all "home" should they be given their final lock-up.

Before reassembling the motor to the sync gear box, check for fredom of the rotor by spinning the shaft and holding the motor close to the ear to listen for any sounds of the rotor hitting or rubbing the stator. Also, feel for any friction or rough spots.

Resolder the wire leads to the motor terminals as described in table 6–11 and reassemble the motor to the sync gear box.



BOTTOM VIEW OF
RIGHT HAND PAPER FEED
GEAR BOX and PAPER SUPPORT
ASSEMBLY

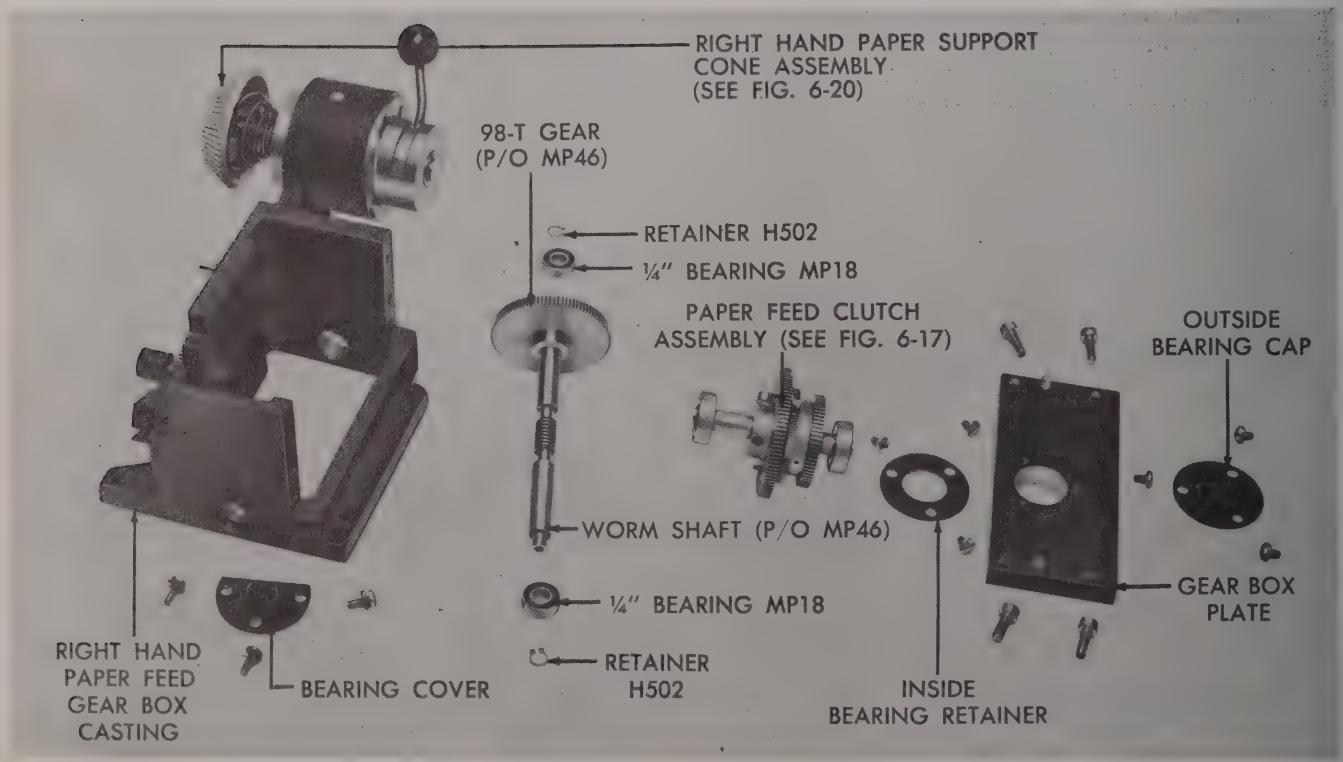

RIGHT HAND PAPER SUPPORT CONE ASSEMBLY (SEE FIG. 6-20)
98-T GEAR (P/O MP46)
RETAINER H502
¼" BEARING MP18
PAPER FEED CLUTCH ASSEMBLY (SEE FIG. 6-17)
OUTSIDE BEARING CAP
WORM SHAFT (P/O MP46)
¼" BEARING MP18
GEAR BOX PLATE
RIGHT HAND PAPER FEED GEAR BOX CASTING
BEARING COVER
RETAINER H502
INSIDE BEARING RETAINER

Figure 6–16. Paper Feed Gear Box and Exploded View

n. PAPER FEED GEAR BOX (figures 6—16, 17).—The shear pin assembly (socket head cap screw and shear pin assembly MP58) is accessible by removing the paper feed gear box cover (step (1) below), but if the paper feed clutch or any of the gears in the right hand paper feed gear box needs repair, the mech unit must be removed from the cabinet (paragraph 6.3—4*a*) and the band removed (paragraph 3—6*d*).

(1) Take off the paper feed gear box cover by removing the three 6-32 x 1/4 binding head mounting screws and No. 6 external lock washers.

(2) If a broken shear pin is suspected of being the cause of trouble, remove the shear pin assembly and check that the pin protrudes about 7/32 of an inch beyond the pin.

(3) Remove the four 10-32 x 1/2 socket head cap screws which hold the gear box plate to the right hand side of the paper feed gear box casting and carefully pull the plate off its mounting pins. The worm gear shaft assembly will come out from the paper feed gear box with the plate.

(4) To disassemble the worm gear shaft:

(*a*) Remove the 5/16-inch retainer (H506) from the loose left end of the shaft and slip off the 8mm. bearing (MP40).

(*b*) Remove the 3/8-inch retainer ring (H507) and thrust spring (MP139) next to the 72-tooth gear. (When reassembling make sure the larger O.D. of the spring presses against the gear.)

(*c*) Slide the 72-tooth gear and 100-tooth ratchet assembly (MP59) off the shaft, being careful not to lose the two pawls and pawl springs which mount on pins in the 100-tooth worm gear.

(*d*) Slide the pawl assemblies (MP41) off their pivot pins, being careful not to damage the wire load springs.

(*e*) Pivot the pawl load springs (MP113) out from under the heads of the drive screws on the 100-tooth worm gear and pull the springs out of their mounting holes.

(*f*) Remove the three washers (H520) near the hub of the worm gear. (Some sets have only two washers, the number being dependent on the space available.)

(*g*) To remove the 100-tooth worm gear assembly (MP57) (including the two 00 x 1/4 drive screws and 1/8 x 3/8 dowel pins) take the shear pin assembly (MP58) out from the hub of the 100-tooth gear and slide the gear from the shaft.

(*h*) To take the worm gear shaft (MP56) off the paper feed gear box plate, remove the three 6-32 x 1/4 binding head screws and No. 6 external lock washers holding the bearing retainer to the inside of the plate and pull the shaft (MP56) out from the inside of the plate. An 8-mm. bearing (MP40) and 5/16-inch retainer ring (H506) will come out with the shaft on the right end.

Note

It is not necessary to disassemble the worm gear shaft to replace the 8-mm. bearing (MP40). With the paper feed gear box plate removed from the paper feed gear box casting, take out the three 6-32 x 1/4 binding head screws and No. 6 external lock washers holding the bearing cap to the outside of the paper feed gear box plate and remove the 5/16-inch retainer ring (H506) from the right end of the shaft. Slide the shaft assembly out of the bearing. Remove the three 6-32 x 1/4 binding head screws and No. 6 external lock washers mounting the bearing retainer plate to the inside of the plate, take off the plate and push the 5/16-inch bearing (MP40) out of the paper feed gear box plate.

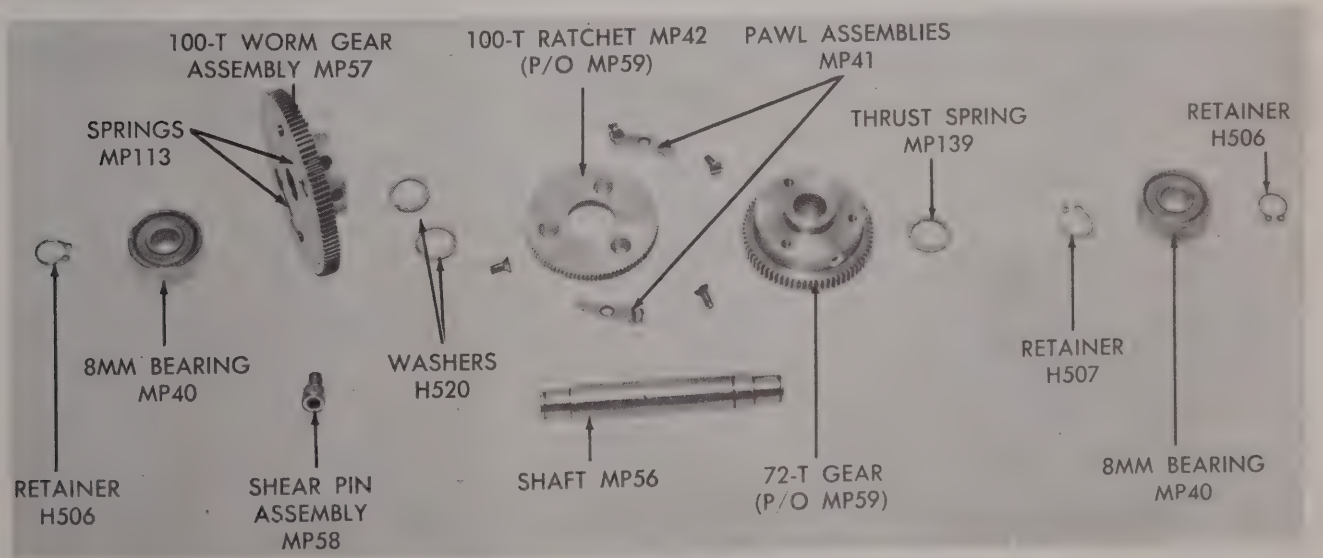


Figure 6—17. Paper Feed Clutch and Ratchet Assembly

(5) To take out the 98-tooth gear and worm shaft assembly (MP46):

(*a*) Remove the three 6-32 x 3/8 binding head screws and No. 6 external lock washers mounting the bearing cover to the front of the mech unit (behind the upper right part of the run wheel). Take off the bearing cover and remove the 1/4-inch retainer ring (H502) from the front end of the shaft.

(*b*) Remove the run clutch cover in the rear of the mech unit by taking out the four 6-32 x 1/4 binding head screws and No. 6 external lock washers and remove the 1/4-inch retainer ring (H502) from the rear end of the shaft.

(*c*) Move the worm shaft forward slightly to push the 1/4-inch bearing (MP18) on the front end of the shaft out of the gear box casting.

(*d*) Move the worm shaft towards the rear to push the 1/4-inch bearing (MP18) on the rear of the shaft out of the gear box casting.

(*e*) Carefully manipulate the gear and worm shaft assembly out of the gear box.

When reassembling the gear and worm shaft assembly into the paper feed gear box, first insert a 1/4-inch bearing (MP18) in the rear wall of the gear box casting (under boss), slide the gear and worm shaft assembly (end without the gear) into the hole in the front wall of the gear box casting, insert the gear end of the shaft through the bearing in the rear gear box wall and capture the shaft with a 1/4-inch retainer ring (H502). Add the other 1/4-inch bearing (MP18) on the front end of the shaft and capture with a 1/4-inch retainer ring (H502). Replace the bearing and run clutch covers.

o. PAPER FEED DRUM ASSEMBLY (figure 6—18). —To repair or replace the bearings or gears of the paper feed drum assembly, it is necessary to take the complete assembly off the mech unit and then disassemble the components from the drum shaft (MP122). The manual paper advance wheel, though, can be removed from the drum shaft (step (4) below) without necessarily taking the drum assembly out. (The mech unit should be removed from the cabinet — see paragraph 4*a* above).

(1) Remove the bearing cap at each side of the drum by taking out the two 8-32 x 7/8 socket head cap screws and No. 8 split washers that hold the bearing cap to the casting (figure 6—19). The front pressure roller assemblies will come off with the bearing caps.

(2) Remove the paper feed gear box cover by taking out the three 6-32 x 1/4 binding head mounting screws and No. 6 external lock washers mounting it to the casting.

(3) Lift the complete drum assembly out of the mech unit.

(4) To remove the manual paper advance wheel assembly (MP120), take off the retainer (H508) and spacer (H530) on the outside of the wheel and slide the wheel and hub assembly off the shaft.

(5) Remove the second spacer (H530) and retainer ring (H508).

(6) Knock out the 1/16 x 1/2 roll pin in the clutch key and slide the key (MP81) off the shaft.

(7) The mini-clutch (MP80) can now be slid off the shaft. If any of the springs (MP125) need replacement, slip the small end coil of the spring around the spring stud and slip the large end under the roller.

(8) Remove washer (H520) and slip 3/8-inch bronze bearing (MP89) off the shaft.

(9) Slide the 1/2-inch long flanged bronze bearing (MP88) off the shaft from the left end of the drum.

(10) Slide the .640-inch ID spacer (H529) off the shaft.

(11) Knock out the 1/8 x 13/16 roll pin to the right of the 72-tooth gear at the right of the drum and slide the drum assembly, together with the two 72-tooth gears, off the shaft. The 72-tooth gears (MP82) may be disassembled from the drum assembly (MP86) by removing the three 4-40 x 3/8 flat head screws that hold each gear to the drum end bells.

(12) The 48-tooth gear (MP123) may be removed from the right end of the drum shaft by knocking the 1/8 x 13/16 roll pin out from the hub of the gear.

(13) The .468-inch long flanged bearing (MP90) and .640-inch ID spacer (H529) may then be slid off the shaft.

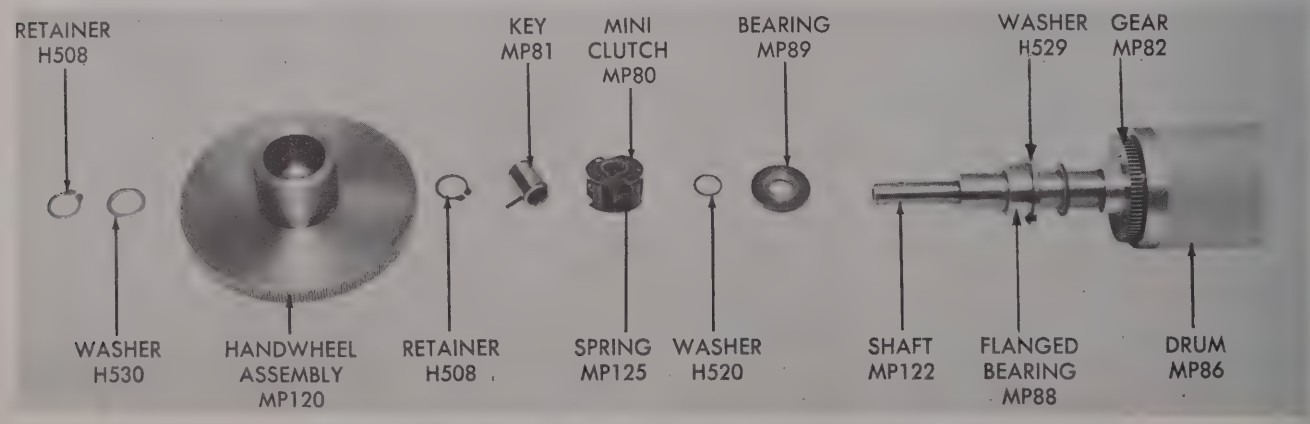


Figure 6—18. Paper Feed Drum Assembly, Left Hand Side

(14) The following precautions must be observed when reassembling the components onto the drum shaft (MP122) in the reverse manner to that described above:

(*a*) When replacing the mini-clutch on the shaft, make sure that when looking at the shaft from the handwheel end, the rollers are ahead of their springs in a counterclockwise direction.

(*b*) When inserting the roll pin in the mini-clutch key (MP81) on the left end of the shaft, make sure the roll pin is flush with or below the surface of the key sleeve.

(*c*) When replacing the drum in place on the mech unit, make sure the slots in the flanges of the bronze bearings (MP88 and MP90) on each side of the drum assembly are facing upward, so that they will engage the pins in the bearing caps.

(*d*) Also, when replacing the drum, be careful not to bend the paper guide spring fingers.

p. FRONT PRESSURE ROLLER ASSEMBLIES (figures 4—15 and 6—19).—To make any repairs in the front pressure roller assemblies, the complete assembly should be removed from the mech unit and then the components disassembled from the arm. The left and right front pressure roller assemblies are alike except for the arms and the side of the arm on which the components are assembled.

(1) Remove the bearing cap and pressure roller assemblies from the casting at each side of the drum as described in paragraph *o*, step (1) above.

(2) Take the 1/4-inch retainer (H502) off the pivot stud and remove the spring (MP95). (When reassembling, tighten spring by twisting it approximately 1/4 turn before sliding spring over pivot stud, making certain that "D" shaped end of spring slides into slot in shaft. The front of the pressure arm should be spring-loaded in the up position.)

(3) Remove the second 1/4-inch retainer ring (H502) and slide the spacer (H532), 33-tooth gear assembly (MP97) and another spacer (H532) off the stud shaft.

(4) To remove the 27-tooth gear and bearing assembly (MP93), take off the 1/4-inch retainer ring (H502) and 3/8-inch OD spacer (H532) and slide the gear and bearing assembly off the middle stud shaft.

(5) To remove the rubber pressure roller and shaft assembly (MP92), knock out the 1/16 x 3/8 roll pin from the hub of the 18-tooth gear (MP124) and slip the gear and the 11/32-inch OD spacer (H531) off the end of the pressure roller shaft. The rubber rollers and shaft can then be pulled out of the arm.

(6) The block assembly (right hand — MP117, left hand — MP118) consisting of the arm, wear plate and drive screws, two bronze bearings and the shaft for the 27-tooth gear, should be replaced as one complete assembly.

q. RIGHT HAND PAPER SUPPORT CONE ASSEMBLY (figures 4—15 and 6—20).—To repair the right hand cone clutch or to get access to any of the parts of the right hand paper support cone assembly, it may be dismantled as follows: (The mech unit should be removed from the cabinet, paragraph 6.3—4*a*.)

(1) Put the CONE LOCK LEVER in the RELEASE position.

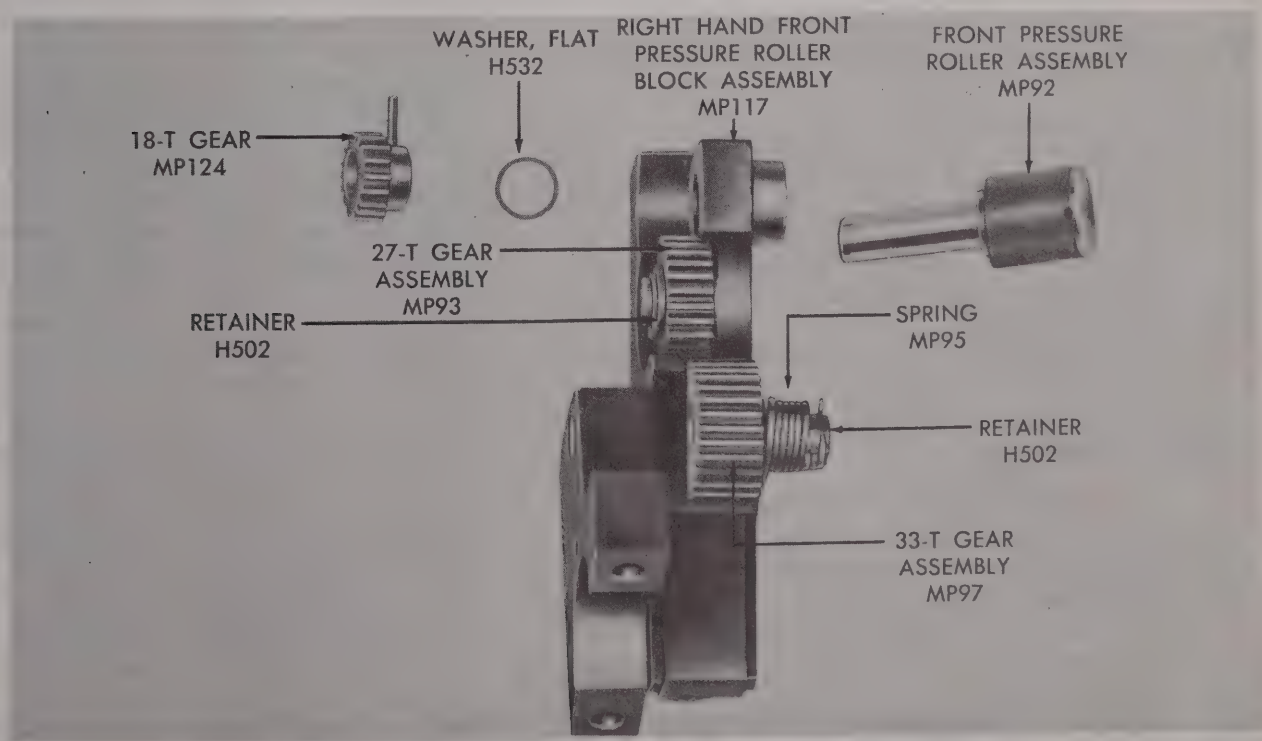


Figure 6—19. Front Pressure Roller Assemblies, Right Hand

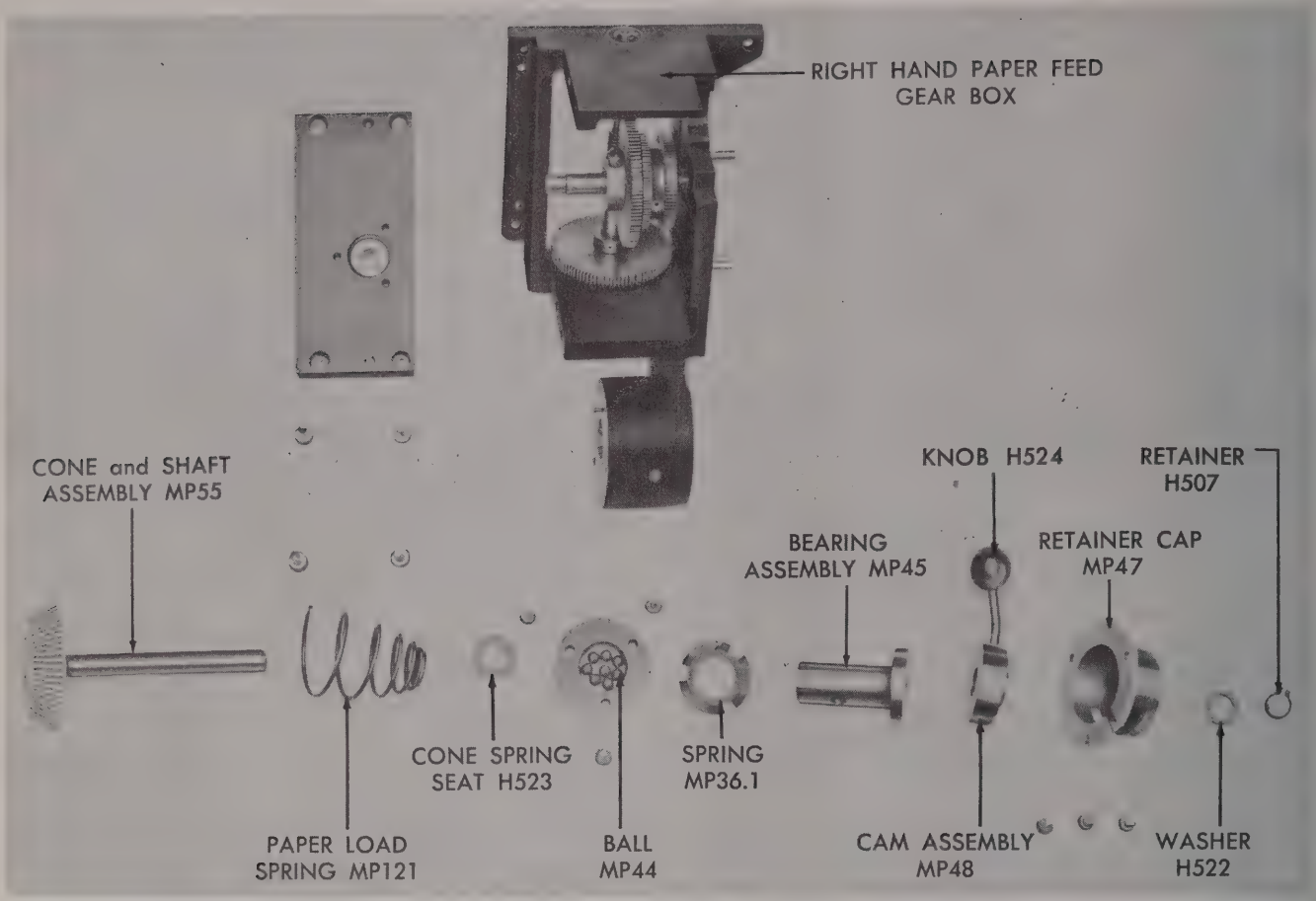


Figure 6—20. Right Hand Paper Support Cone Assembly

(2) Push the right hand cone against the paper load spring (MP121) and remove the 3/8-inch retainer ring (H507) and spacer (washer H522) from the outside end of the shaft.

(3) Hold one hand under the shaft and carefully slide the cone and shaft assembly (MP55), together with the paper load spring (MP121) and spring seat (washer H523), out of the left side of the bearing block casting. The eight 7/32-inch diameter steel balls (MP44) of the cone clutch will drop out of the casting while the shaft is sliding out.

(4) To remove the cone clutch stop (MP43), take out the three 6-32 x 1/2 binding head screws and No. 6 external lock washers mounting it to the left side of the bearing block casting.

Note

When reassembling the right cone assembly parts, make sure the clutch stop is centrally aligned around the shaft to ensure full engagement of the balls on the shaft when the clutch is in the locked position.

(5) Take the clutch retainer cap (MP47) off by removing the 6/32 x 1/4 binding head screws and No. 6 external lock washers mounting it to the right side of the bearing block casting.

(6) The right hand cone clutch cam assembly (MP48) with the knob (H524) screwed on the cam arm can be disassembled from the clutch retainer cap (MP47) by first aligning the cam arm with the slot provided in the cap for disassembly and then sliding the cam assembly out of the cap in the direction of the flange. There are three washers (H543) between the cam assembly and the retainer cap.

(7) The cone clutch bearing sleeve assembly (MP45) (including two porous bronze bearings) and thrust spring (MP36.1) may be slid out of the casting.

r. LEFT HAND PAPER SUPPORT CONE ASSEMBLY (figures 4—15 and 6—21). — The tension of the paper drag clutch on the left hand paper support cone shaft may be adjusted as described in paragraph 6.3—4*s* without disassembling any components, but to dismantle the left hand cone assembly, the mech unit should be removed from the cabinet (paragraph 6.3—4*a*).

(1) Loosen the 6-32 x 3/8 socket head cap screw in the clutch clamp (H525) on the left end of the cone shaft.

(2) Holding the rest of the assembly so that the clutch pin is engaged against the stop pin (figure 6—6),

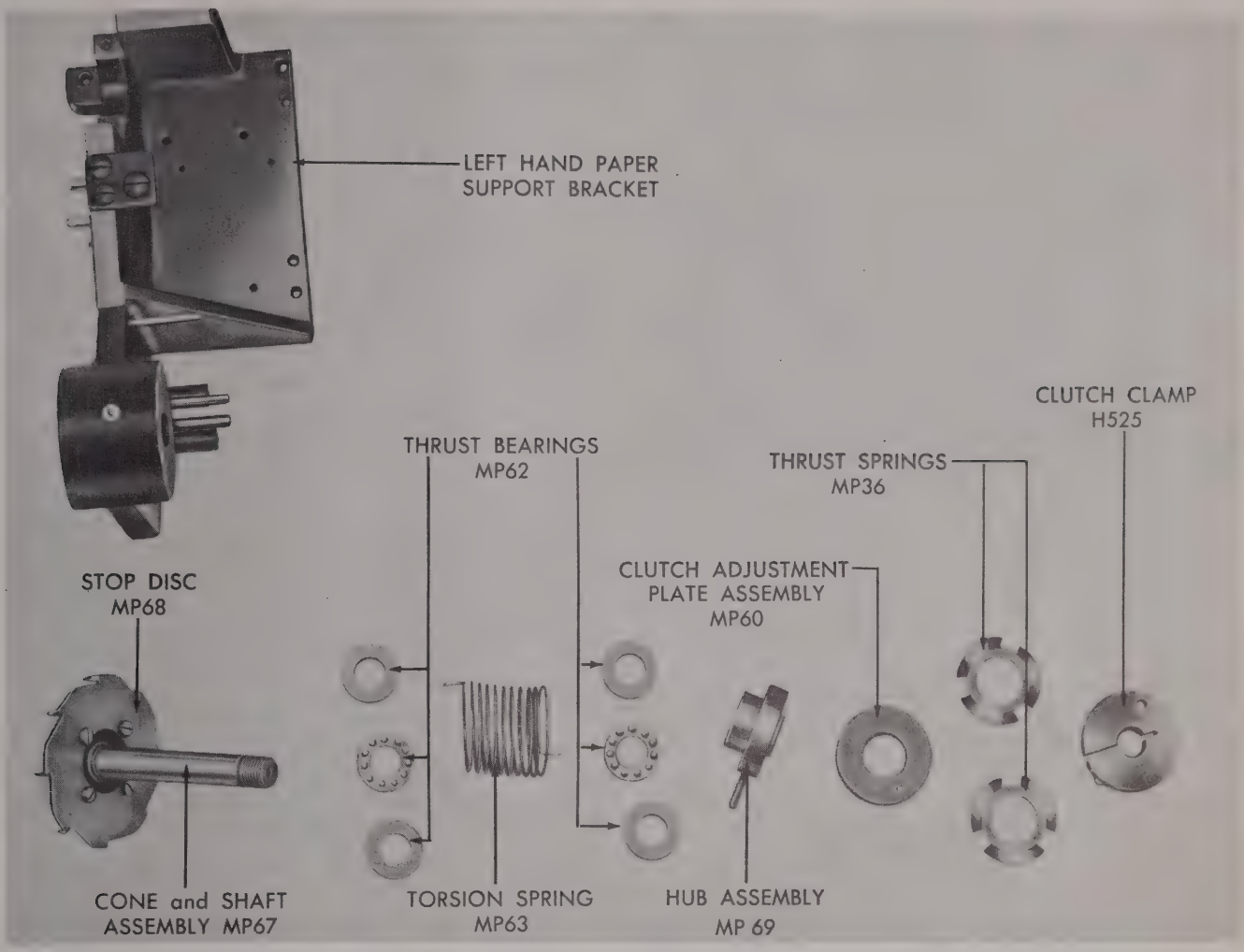


Figure 6—21. Left Hand Paper Support Cone Assembly, Exploded View

rotate the clutch clamp off the shaft and remove the two thrust springs (MP36).

(3) Carefully allow the clutch adjustment plate assembly (MP60), hub assembly (MP69) (including the clutch pin) and torsion spring (MP63) to slide out along the shaft until the clutch pin is free of the stop pin. Permit the spring to unwind slowly and then slide the plate assembly (MP60), hub assembly (MP69) and spring (MP63) off the shaft.

(4) Slide the left thrust bearing (MP62) off the shaft.

(5) The left hand paper cone and shaft assembly (MP67) may be removed by sliding the shaft out of the support casting.

(6) Remove the right thrust bearing (MP62) by sliding it off the shaft.

(7) Take the stop disc (MP68) off by removing the four 4-40 x 5/8 binding head screws that mount it to the cone.

When reassembling the left hand paper cone assembly, mount the components in the reverse order to that mentioned above, but before putting the torsion spring back on the shaft, it must be wound in a clockwise direction (looking from the left hand end) two and three-quarters to three turns from its free position. The paper drag clutch tension should be set as described in paragraph 6.3—4*s*.

s. PAPER DRAG CLUTCH TENSION. — The paper drag clutch on the left end of the left hand paper support cone shaft should have a tension of 4 to 4½ pounds. A spring scale and a 4-foot long cord are necessary to check the tension.

(1) Open the cabinet.

(2) Place an empty paper roll core between the paper support cones.

(3) Tape one end of the 4-foot cord to the core.

(4) Rotate the core as if advancing recording paper and wrap three feet of the cord around the core so that the free end comes from the under-side of the core towards the front of the machine.

(5) Hook a spring scale to the free end of the cord and pull on the scale to measure the force necessary to unwind the cord. The force should be 4 to 4½ pounds when the spring stops turning and the clutch slips.

(6) If the tension should be increased, loosen the lock screw in the clutch adjustment nut located on the extreme left hand side of the left cone shaft and rotate the nut to advance toward the core. To decrease the tension, back the nut away from the core. Retighten the lock screw in the clutch adjustment nut when the correct tension is achieved.

t. REAR PRESSURE ROLLER ASSEMBLIES (figure 6—22). — To repair the right or left hand rear rubber roller and gear assembly (MP114) or rear pressure roller arm and bearing assembly (right hand rear pressure roller block assembly MP115, left hand rear pressure roller block assembly MP116), the rear pressure rollers should be taken off the mech unit, but the rear pressure roller spring (MP49) may be replaced without removing the assembly. The rear pressure roller assemblies at the right and left sides are alike except for the block assemblies.

(1) Remove the rear pressure roller helical spring (MP49) by unhooking one end of the spring from the stud in the mech unit casting and the other end from the spring pin on the arm.

(2) Remove the 3/16-inch retainer ring (H501) and spacer (H526) and pull the assembly off the stud.

(3) To remove the rubber roller and 33-tooth gear assembly (MP114) take off the 3/16-inch retainer ring (H501) and spacer (H526) at the end of the roller shaft and pull the rubber roller, shaft and 33-tooth gear out of the block assembly. There is another spacer (H526) on the roller shaft between the gear and the arm.

(4) To remove the leaf spring (MP54) take out the 6-32 x 3/8 binding head screw and No. 6 external lock washer holding the leaf spring to the arm and slip the spring off the roll pin. When reassembling make sure the roll pin protrudes slightly above the screw head.

(5) The rear pressure roller block assembly (right-MP115, left-MP116), including the rear pressure roller arm, two compo bearings, a spring pin and a roll pin, should be replaced as a complete assembly.

u. PRESSURE ROLL CAM SHAFT ASSEMBLY (figure 6—22). The pressure roller cam shaft assembly determines the pressure the pressure rollers exert on the recording paper. Recording copy defects such as line grouping or horizontal streaks across the copy resulting from erratic paper feed may be caused by an improper adjustment of the cam shaft assembly.

The cam shaft assembly should be adjusted so that the front pressure rollers exert sufficient pressure against the paper to properly feed the paper around the drum when a recording is being made, and so that the rear pressure rollers exert enough pressure on the paper to push the paper around the drum when loading the equipment with recording paper. These pressures are controlled by the tension in the torsion springs (MP77) at each end of the cam shaft, the position of the PAPER FEED lever stop screw which determines the pressure the cams will exert on the front pressure roller arms, and the position of the LATCH which determines the pressure the cams exert on the rear pressure roller leaf springs. Consideration must also be given to the small clearance between the PAPER FEED lever and the cabinet hood.

Nominal pressure values are two to two and a half

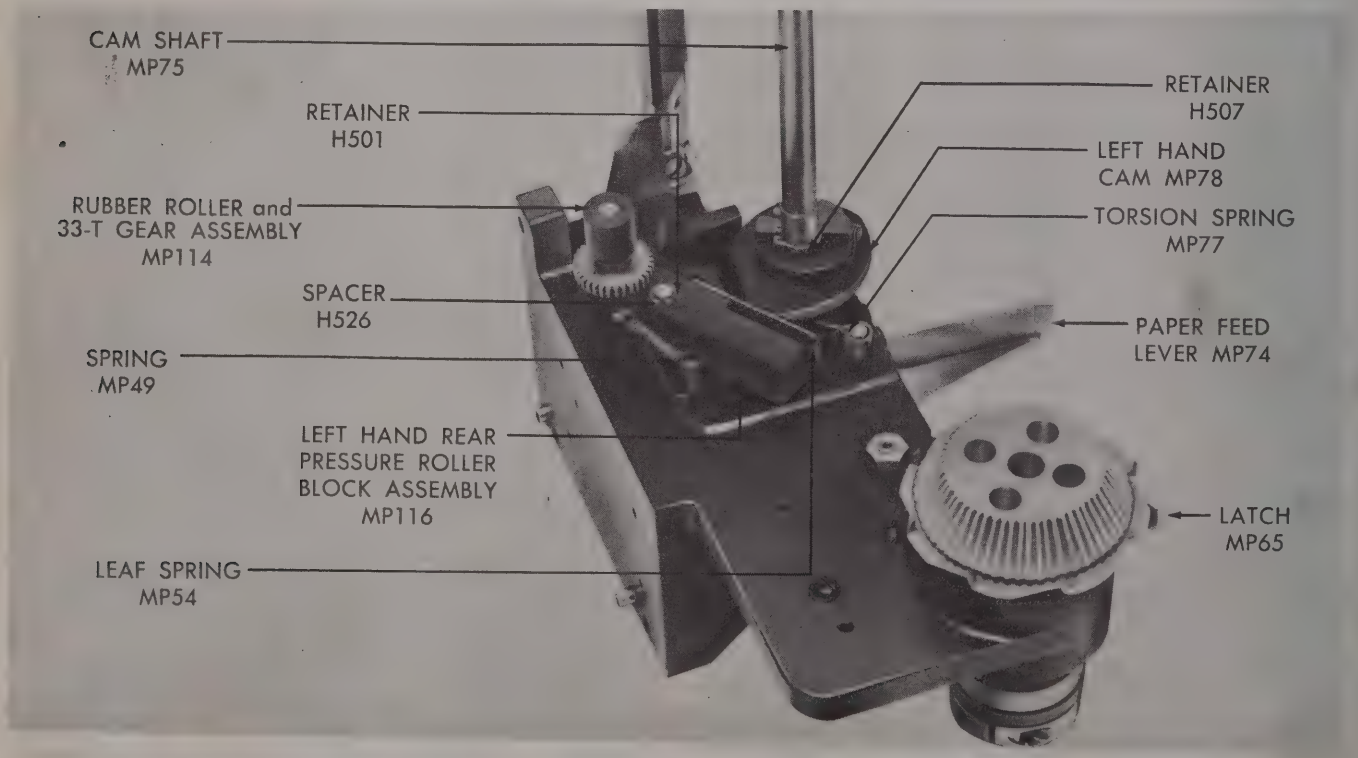


Figure 6—22. Right Hand Rear Pressure Roller Assembly and Cam Shaft Assembly

INDEX TO PART L
REC

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B401	2E
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C4	3B
C5	8A
C6	6B
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C8	7B
C9	4B
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C507	7A
C601	2B
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C603	1B
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CR2	4B
CR101	10C
CR102	6C
CR103	6C
CR104	5C
CR105	2D
CR106	2D
CR201	4D
CR401	3D
CR402	3D
CR403	4D
CR404	3E

REF. DESIG.
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CR406
CR407
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DS2
DS3
DS4
DS201
DS202
E501
F201
F202
F203
F204
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FL101
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FL103
FL104
FL201
FL601
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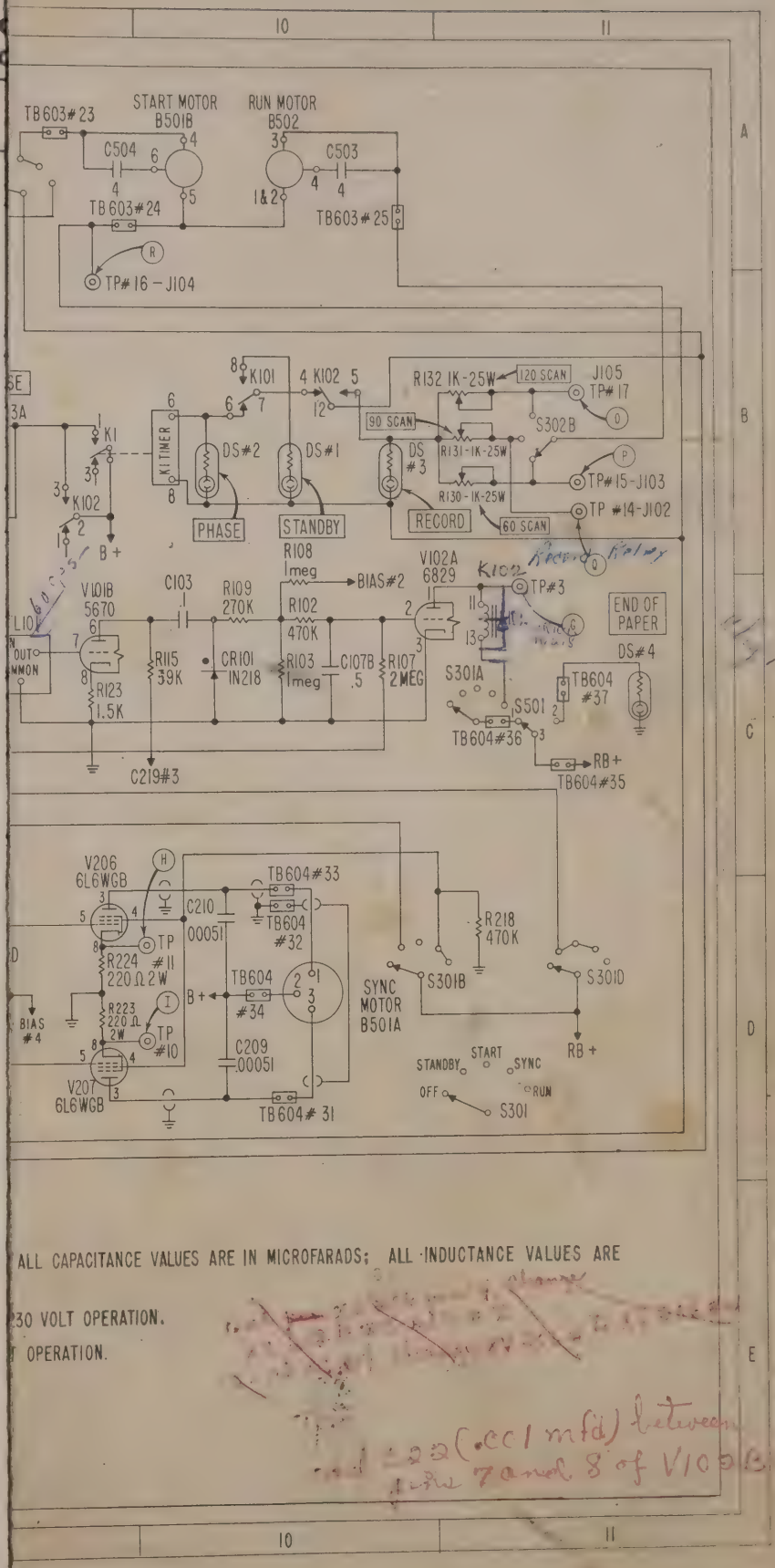

*The coordinates refer to the numbers along t

corder Set, Facsimile AN/UXH-2, Overall Schematic Diagram

(6) If the tension should be increased, loosen the lock screw in the clutch adjustment nut located on the extreme left hand side of the left cone shaft and rotate the nut to advance toward the core. To decrease the tension, back the nut away from the core. Retighten the lock screw in the clutch adjustment nut when the correct tension is achieved.

t. REAR PRESSURE ROLLER ASSEMBLIES (figure 6—22). — To repair the right or left hand rear rubber roller and gear assembly (MP114) or rear pressure roller arm and bearing assembly (right hand rear pressure roller block assembly MP115, left hand rear pressure roller block assembly MP116), the rear pressure rollers should be taken off the mech unit, but the rear pressure roller spring (MP49) may be replaced without removing the assembly. The rear pressure roller assemblies at the right and left sides are alike except for the block assemblies.

(1) Remove the rear pressure roller helical spring (MP49) by unhooking one end of the spring from the stud in the mech unit casting and the other end from the spring pin on the arm.

(2) Remove the 3/16-inch retainer ring (H501) and spacer (H526) and pull the assembly off the stud.

(3) To remove the rubber roller and 33-tooth gear assembly (MP114) take off the 3/16-inch retainer ring (H501) and spacer (H526) at the end of the roller shaft and pull the rubber roller, shaft and 33-tooth gear out of the block assembly. There is another spacer (H526) on the roller shaft between the gear and the arm.

(4) To remove the leaf spring (MP54) take out the 6-32 x 3/8 binding head screw and No. 6 external lock washer holding the leaf spring to the arm and slip the spring off the roll pin. When reassembling make sure the roll pin protrudes slightly above the screw head.

(5) The rear pressure roller block assembly (right-MP115, left-MP116), including the rear pressure roller arm, two compo bearings, a spring pin and a roll pin, should be replaced as a complete assembly.

u. PRESSURE ROLL CAM SHAFT ASSEMBLY (figure 6—22). The pressure roller cam shaft assembly determines the pressure the pressure rollers exert on the recording paper. Recording copy defects such as line grouping or horizontal streaks across the copy resulting from erratic paper feed may be caused by an improper adjustment of the cam shaft assembly.

The cam shaft assembly should be adjusted so that the front pressure rollers exert sufficient pressure against the paper to properly feed the paper around the drum when a recording is being made, and so that the rear pressure rollers exert enough pressure on the paper to push the paper around the drum when loading the equipment with recording paper. These pressures are controlled by the tension in the torsion springs (MP77) at each end of the cam shaft, the position of the PAPER FEED lever stop screw which determines the pressure the cams will exert on the front pressure roller arms, and the position of the LATCH which determines the pressure the cams exert on the rear pressure roller leaf springs. Consideration must also be given to the small clearance between the PAPER FEED lever and the cabinet hood.

Nominal pressure values are two to two and a half

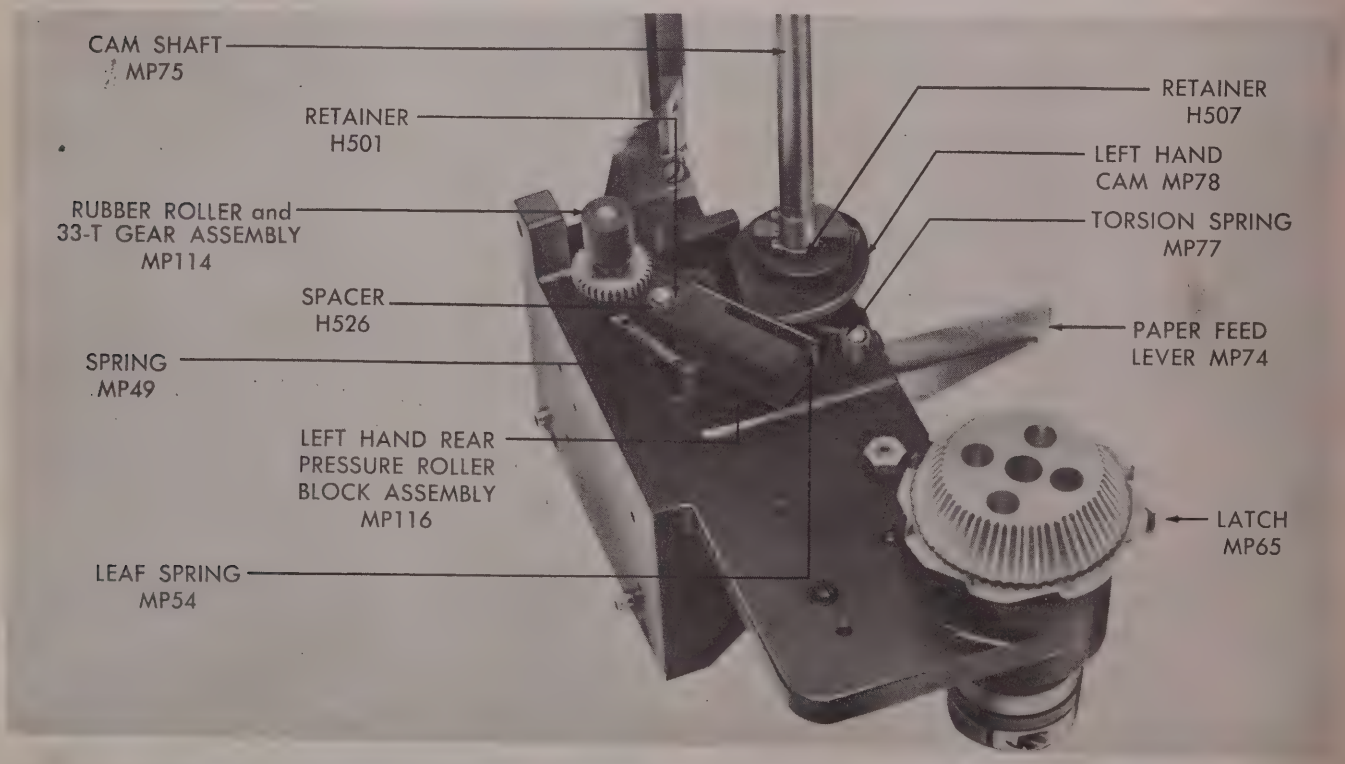

Figure 6—22. Right Hand Rear Pressure Roller Assembly and Cam Shaft Assembly

INDEX TO PART LOCATIONS ON OVERALL SCHEMATIC DIAGRAM OF RECORDER SET, FACSIMILE AN/UXH-2

REF. DESIG.	*LOCATION COORDINATES
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B502	10A
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C2	2A
C3	3B
C4	3B
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C103	9C
C104	8E
C105	4E
C106	5C
C107	5E, 10C
C108	6C
C109	7C
C110	5C
C111	5E
C112	6E
C202	4C
C203	5D
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C219	6B, 3B, 6D
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C402	4E
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C404	4E
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C502	6A
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C504	9A
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S305	4B, 5C
S306	4C
S101	3D
S501	11C
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T2	3A
T3	4A
T4	8A
T5	6A
T101	2D
T201	9D
T301	2A
T401	3D, E
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V207	9D
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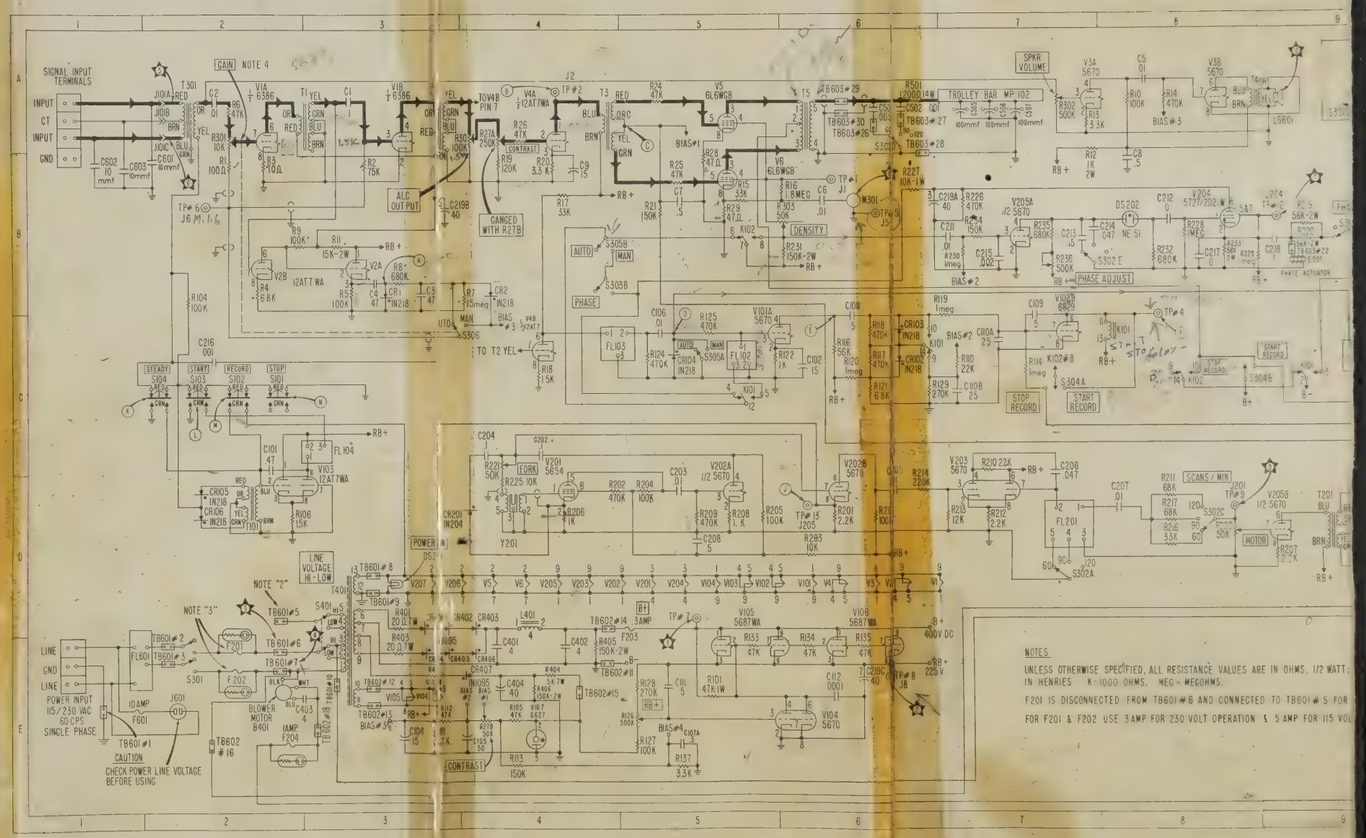


Figure 6–24. Recorder Set, Facsimile AN/UXH-2, Overall Schematic Diagram

pounds necessary to push the tip of the PAPER FEED lever back, and a similar force of two to two and a half pounds exerted by the pressure rollers on the paper, but these figures are variable, depending on the surfaces of the drum and the paper.

It is not necessary to disassemble the cam shaft (paragraph 6.3—4*u*(2)) to make these adjustments, but the mech unit should be removed from the cabinet (paragraph 6.3—4*a*).

(1) ADJUSTING THE CAM SHAFT ASSEMBLY.

(*a*) Loosen the 10-32 x 1/2 socket head cap screw locking the hub of each cam, and loosen the 10-32 x 5/8 socket head cap screw clamping the PAPER FEED lever to the cam shaft (figure 6—5).

(*b*) With the torsion spring (MP77) in position at each end of the cam shaft, wind the cam shaft in a counterclockwise direction, looking from the left hand end, approximately one-half a turn.

(*c*) Tighten the PAPER FEED lever clamp and measure the force necessary to push the tip of the lever back. It should be approximately two to two and a half pounds. If necessary, unlock the PAPER FEED lever clamp and make a further adjustment. Make sure when the adjustment is completed that the locking screw in the PAPER FEED lever clamp block is tight and that the PAPER FEED lever lines up squarely and locks under the LATCH.

(*d*) Hold the PAPER FEED lever back with the LATCH. Insert a full width piece of recording paper between the rear pressure rollers and the drum and attach a spring scale to the paper. Rotate the cams around the shaft by hand until they load the rear pressure rollers against the drum to the extent that a force of approximately two to two and a half pounds is necessary to pull the paper between the rollers and the drum. The cams should be against the split sleeves and the flats on the cams in the approximate position shown in figure 6—22. Tighten the lock screws in the hubs of the cams.

(*e*) When the PAPER FEED lever is released from the LATCH, the torsion springs should rotate the shaft in a clockwise direction, looking from the left hand end, and the PAPER FEED lever should come to rest against the stop screw, while loading the front pressure rollers against the drum so that a force of approximately two to two and a half pounds is necessary to pull a full-width piece of recording paper between the front pressure roller assemblies and the drum. Check this before replacing the mech unit into the cabinet.

If after making the above adjustments the paper still does not feed properly around the drum when loading or when recording, the two screws in the LATCH can be loosened and the LATCH moved up or down slightly to decrease or increase the pressure on the rear rollers, or the PAPER FEED lever stop screw can be advanced or backed off slightly to decrease or increase the pressure on the front pressure rollers.

(2) REMOVING THE CAM SHAFT ASSEMBLY.

(*a*) Slide towards the center of the shaft the 3/8-inch retainer ring (H507) next to the hub of the cam on each end of the shaft.

(*b*) Loosen the 10-32 x 1/2 socket head cap screw locking the hub of each cam and slide the cams (right-MP79, left-MP78) toward the center of the shaft.

(*c*) Slide the two springs (MP77) off the pins and out of the slots in the cam shaft.

(*d*) Pull the cam shaft (MP75) with the PAPER FEED lever attached out of the support casting from the left hand side, allowing the two each spacers (H520), split sleeves (spring retainers H539), springs (MP77), cams, and retainer rings to slide off the right hand end of the shaft.

(*e*) Loosen the 10-32 x 5/8 socket head cap screw clamping the PAPER FEED lever to the left end of the cam shaft and slide the PAPER FEED lever (MP74) and clamp from the cam shaft.

(*f*) The top of release lever (MP64) is sandwiched between the LATCH (MP65) and a nut plate assembly by two 6-32 x 5/8 flat head screws. The release lever spring (MP66) is inserted on the pivot stud between the yoke at the bottom of the release lever so that the straight end is towards the end of the stud and engages into the slot in the stud. The lever yoke and spring are held in place on the stud by a 3/16-inch retainer ring (H501).

When reassembling in the reverse order in the same relative position as formerly, note first that there is a right hand cam (MP79) and a left hand cam (MP78); and secondly, that the adjustment of the cam shaft assembly is critical (see paragraph 6.3—4*u*(1)). This adjustment is made with the components assembled and in position, but before the clamp screws in the cam hubs are tightened.

v. END-OF-PAPER SWITCH S501, OUTPUT CAPACITORS C501 AND C502 AND RESISTOR R501. — The end-of-paper microswitch (S501) is mounted on the left side of the left hand cone assembly support casting (figure 6—6). To replace or repair the switch remove the two 6-32 x 1/4 binding head screws and No. 6 external lockwashers mounting the switch cover to the casting and take out the two 4-40 x 5/8 binding head screws and No. 4 external lock washers mounting the switch to the casting. Unsolder the red/green lead to switch terminal No. 1 (NC), the red/white lead to terminal No. 2 (NO) and the red/yellow lead to terminal No. 3 (C).

Capacitors C501 and C502 are mounted to the left hand side of the left hand paper support casting, one on top of the other, by two 4-40 x 1 binding head screws and No. 4 flat and split washers. Resistor R501 is mounted, with an insulator E504 on each side, to the left hand paper support casting by a 6-32 x 2 round head screw and No. 6 flat and split washer.

One terminal of each capacitor is connected by a jumper wire. A black/green wire is connected to the other terminal of .0051 mf capacitor C502; a black/yellow wire to the other terminal of .001 mf capacitor C501.

To one terminal of resistor R501 are connected a blue coax wire from the mech unit cable and a jumper from the C501 terminal connected to C502. The trolley bar lead is connected to the other terminal of R501.

6.3–5. REMOVAL, REPAIR AND REASSEMBLY OF THE POWER PACK (POWER SUPPLY PP-1901/UXH-2) (Z400), PARTS AND SUBASSEMBLIES (figures 4–9, 5–17 and 5–18.)

The power pack chassis is mounted in the cabinet unit behind the mech unit (figure 1–2). To remove or make repairs to any of the components mounted on the power pack chassis, it is first necessary to remove the mech unit (paragraph 6.3–4*a*). The plug-in capacitor C404 may be removed from the top of the chassis, but to get access to any of the other components the whole power supply unit should be removed from the cabinet.

a. REMOVING THE POWER SUPPLY.

(1) Disconnect the power cord from the AC source.

(2) Disconnect the twelve leads to the interconnecting terminal boards as shown in table 6–12.

(3) Take out the 6-32 binding head screw mounting the cable clamp on the power supply cable to the cabinet base, but the clamp may be left on the cable.

(4) Open the hose clamp (MP108) holding the exhaust hose to the vent on the rear cabinet wall.

(5) Remove the twelve 10-32 x $\frac{1}{2}$ hex head slotted cap screws mounting the power pack chassis to the cabinet and carefully lift out the entire power supply unit.

b. BLOWER UNIT. – The blower motor, volute and blower mounting bracket assembly should be replaced as a complete unit (B401). To take out the blower assembly:

(1) Remove the exhaust hose (MP109) from the blower by opening the clamp (MP108).

(2) Disconnect the three leads from the blower motor – the black lead from terminal 1 of T401, the white lead from terminal 2 of C403, and the blue lead from terminal 1 of C403 (see figure 6–31).

(3) To get to the blower mounting bracket mounting screws it is necessary to first take out the four 6-32 x 5/16 binding head screws and No. 6 external lock washers mounting the resistor and rectifier terminal board to the under side of the chassis. One of the four 10-32 x 7/16 binding head screws which mount the blower mounting bracket is under this terminal board. Remove this and the other three 10-32 x 7/16 binding head screws that mount the blower mounting bracket to the chassis and remove the blower unit.

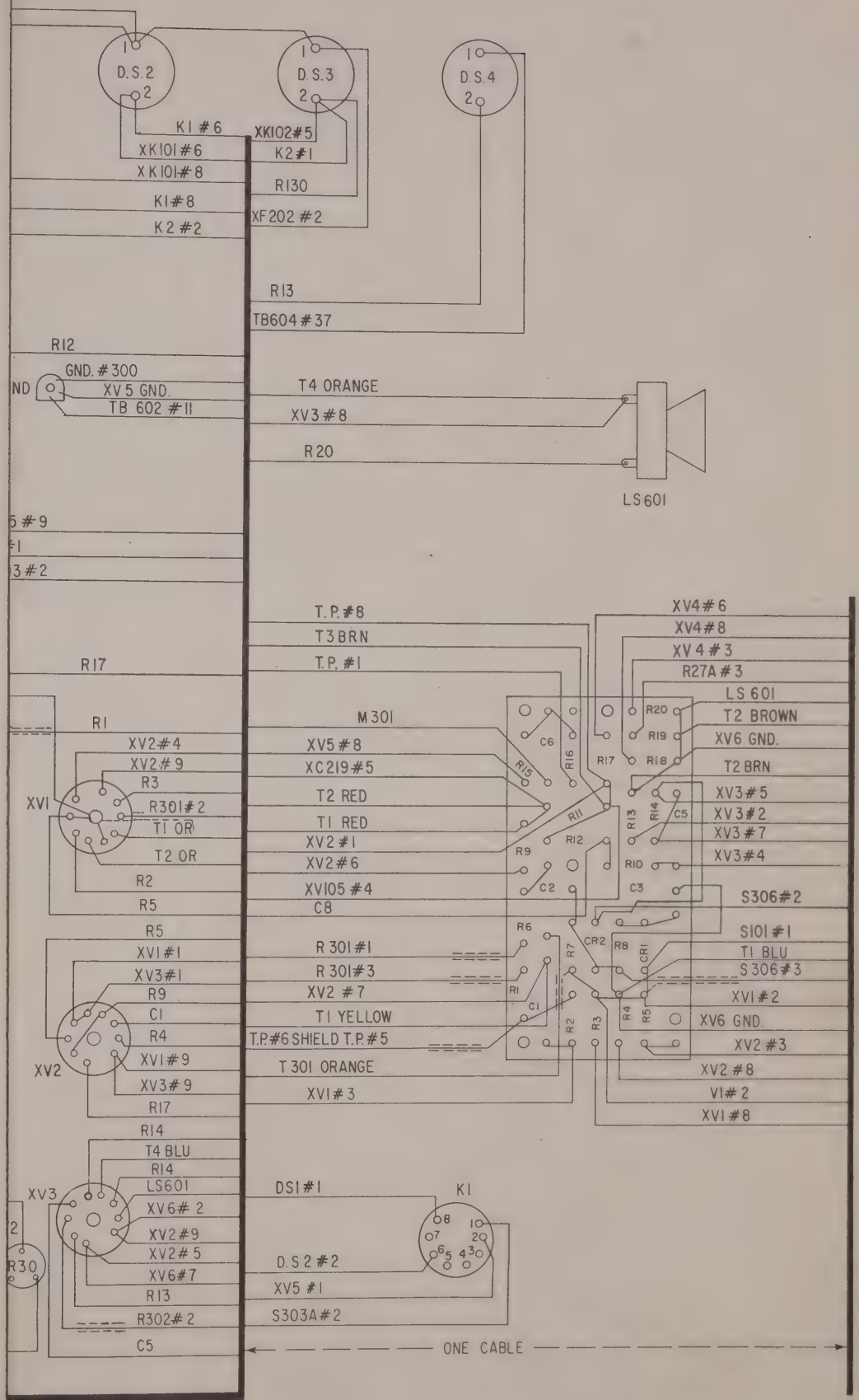
To remove the plug-in blower motor capacitor C403 loosen the capacitor mounting brackets holding the capacitor to the chassis.

6.3–6. OVERALL SCHEMATIC AND WIRING DIAGRAMS.

Figure 6–24 is the overall equipment schematic diagram and figures 6–25 through 6–31 show the wiring layout. Figure 6–32 is a schematic of the filament wiring.

TABLE 6–12. POWER SUPPLY CABLE CONNECTIONS TO TERMINAL BOARDS

COLOR CODE	TERMINAL BOARD	PIN NUMBER	SIDE
gray/red	TB601	5	right
gray/orange	TB601	6	right
gray/green	TB601	7	right
brown	TB601	8	right
brown/orange	TB601	9	right
gray/blue	TB601	10	right
black	TB602	11	left
brown/red	TB602	12	left
brown/red	TB602	13	left
violet/orange	TB602	15	left
red/blue	TB602	14	left



gure 6—25. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, ALC Circuit

One terminal of each capacitor is connected by a jumper wire. A black/green wire is connected to the other terminal of .0051 mf capacitor C502; a black/yellow wire to the other terminal of .001 mf capacitor C501.

To one terminal of resistor R501 are connected a blue coax wire from the mech unit cable and a jumper from the C501 terminal connected to C502. The trolley bar lead is connected to the other terminal of R501.

6.3—5. REMOVAL, REPAIR AND REASSEMBLY OF THE POWER PACK (POWER SUPPLY PP-1901/UXH-2) (Z400), PARTS AND SUBASSEMBLIES (figures 4—9, 5—17 and 5—18.)

The power pack chassis is mounted in the cabinet unit behind the mech unit (figure 1—2). To remove or make repairs to any of the components mounted on the power pack chassis, it is first necessary to remove the mech unit (paragraph 6.3—4*a*). The plug-in capacitor C404 may be removed from the top of the chassis, but to get access to any of the other components the whole power supply unit should be removed from the cabinet.

a. REMOVING THE POWER SUPPLY.

(1) Disconnect the power cord from the AC source.

(2) Disconnect the twelve leads to the interconnecting terminal boards as shown in table 6—12.

(3) Take out the 6-32 binding head screw mounting the cable clamp on the power supply cable to the cabinet base, but the clamp may be left on the cable.

(4) Open the hose clamp (MP108) holding the exhaust hose to the vent on the rear cabinet wall.

(5) Remove the twelve 10-32 x ½ hex head slotted cap screws mounting the power pack chassis to the cabinet and carefully lift out the entire power supply unit.

b. BLOWER UNIT. — The blower motor, volute and blower mounting bracket assembly should be replaced as a complete unit (B401). To take out the blower assembly:

(1) Remove the exhaust hose (MP109) from the blower by opening the clamp (MP108).

(2) Disconnect the three leads from the blower motor — the black lead from terminal 1 of T401, the white lead from terminal 2 of C403, and the blue lead from terminal 1 of C403 (see figure 6—31).

(3) To get to the blower mounting bracket mounting screws it is necessary to first take out the four 6-32 x 5/16 binding head screws and No. 6 external lock washers mounting the resistor and rectifier terminal board to the under side of the chassis. One of the four 10-32 x 7/16 binding head screws which mount the blower mounting bracket is under this terminal board. Remove this and the other three 10-32 x 7/16 binding head screws that mount the blower mounting bracket to the chassis and remove the blower unit.

To remove the plug-in blower motor capacitor C403 loosen the capacitor mounting brackets holding the capacitor to the chassis.

6.3—6. OVERALL SCHEMATIC AND WIRING DIAGRAMS.

Figure 6—24 is the overall equipment schematic diagram and figures 6—25 through 6—31 show the wiring layout. Figure 6—32 is a schematic of the filament wiring.

TABLE 6—12. POWER SUPPLY CABLE CONNECTIONS TO TERMINAL BOARDS

COLOR CODE	TERMINAL BOARD	PIN NUMBER	SIDE
gray/red	TB601	5	right
gray/orange	TB601	6	right
gray/green	TB601	7	right
brown	TB601	8	right
brown/orange	TB601	9	right
gray/blue	TB601	10	right
black	TB602	11	left
brown/red	TB602	12	left
brown/red	TB602	13	left
violet/orange	TB602	15	left
red/blue	TB602	14	left

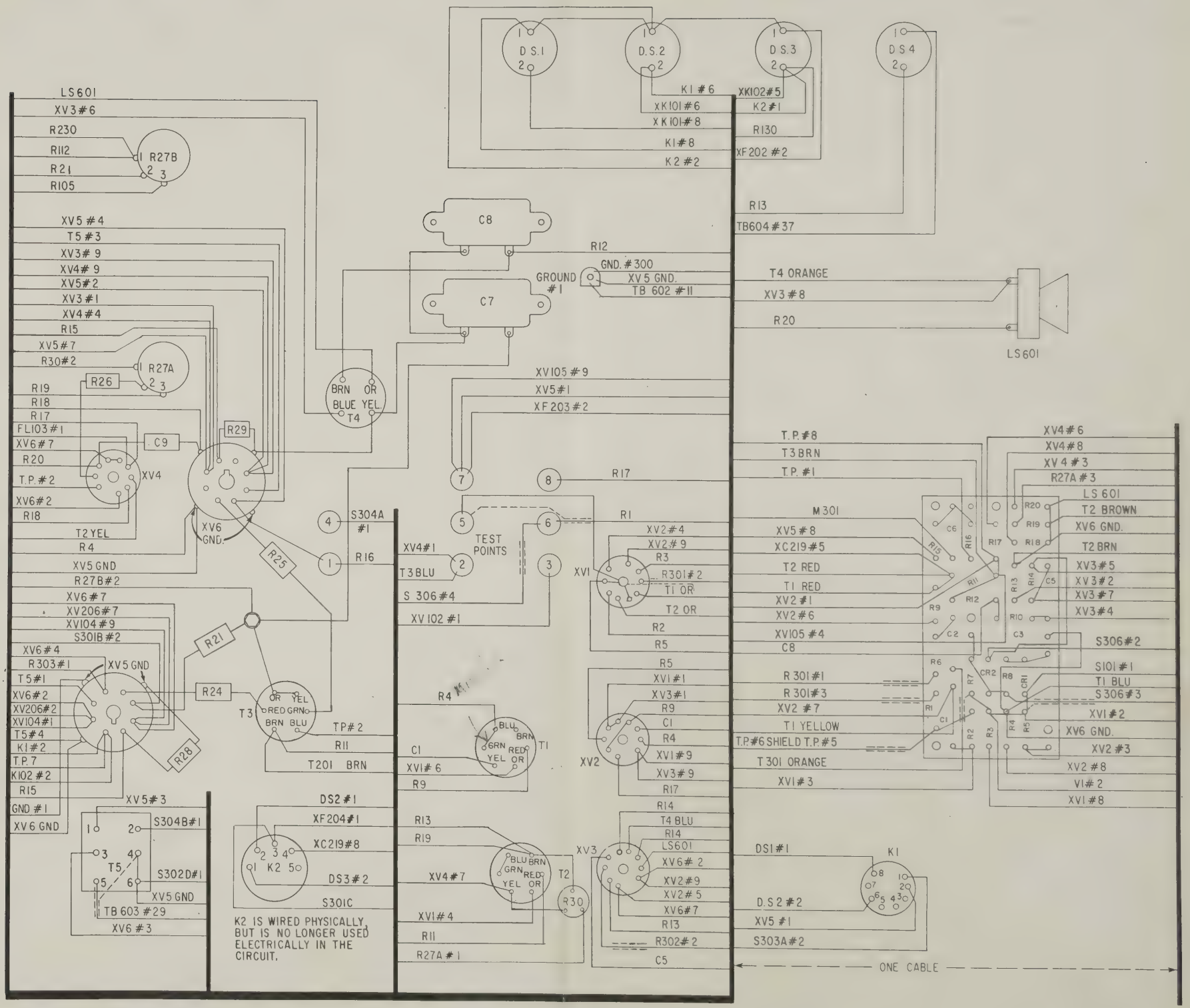
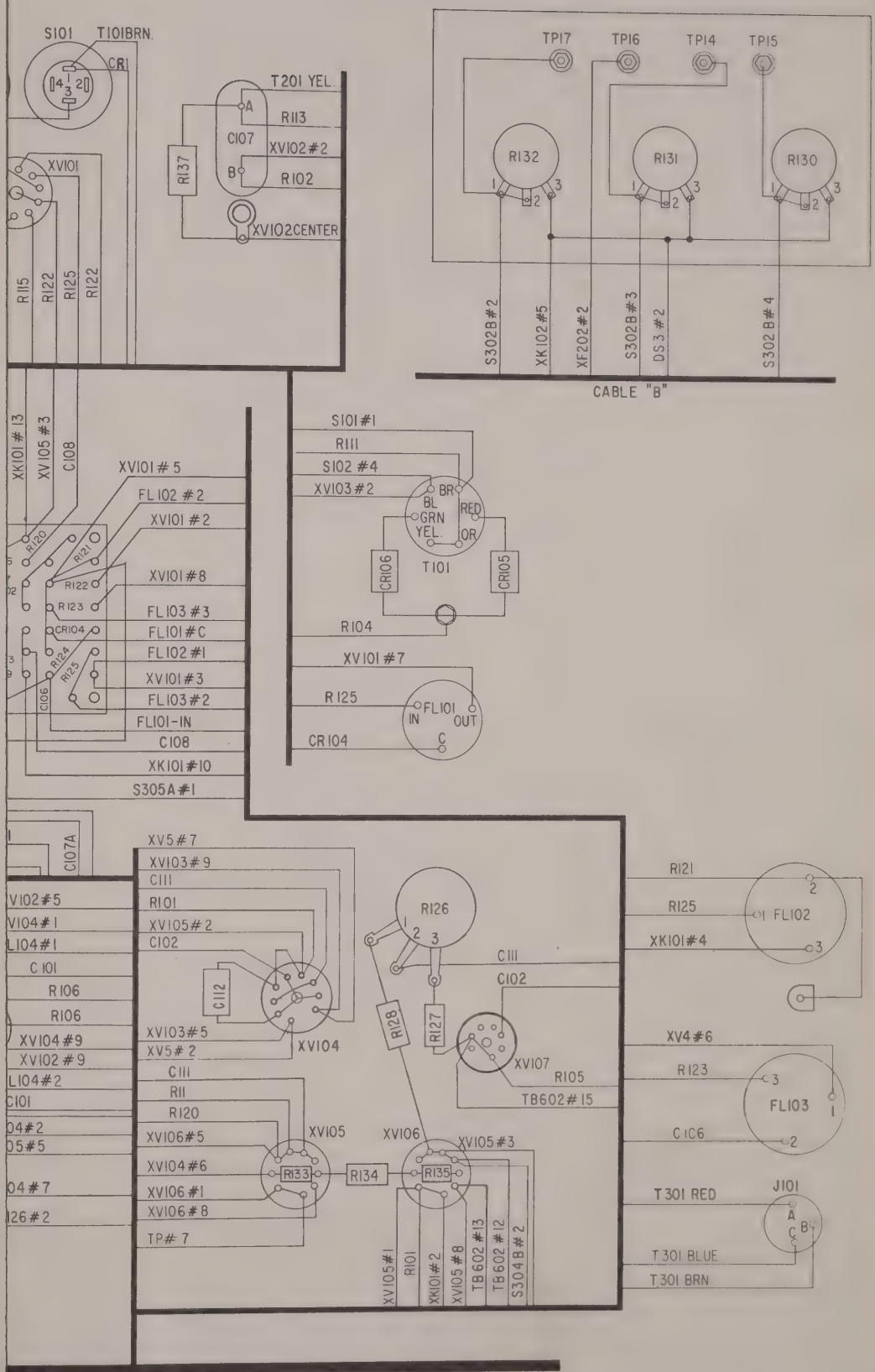


Figure 6–25. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, ALC Circuit



6–26. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, Control Chassis

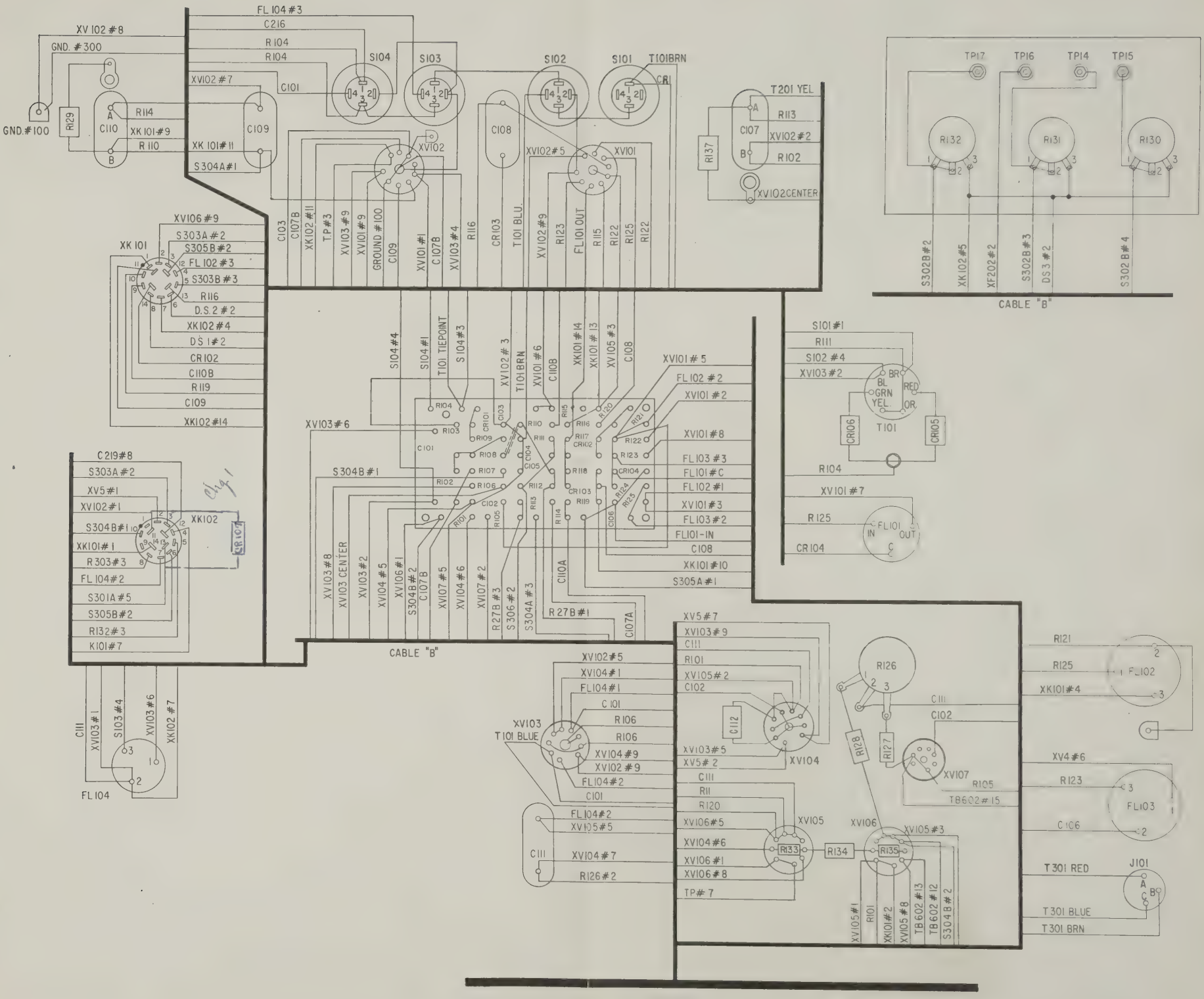
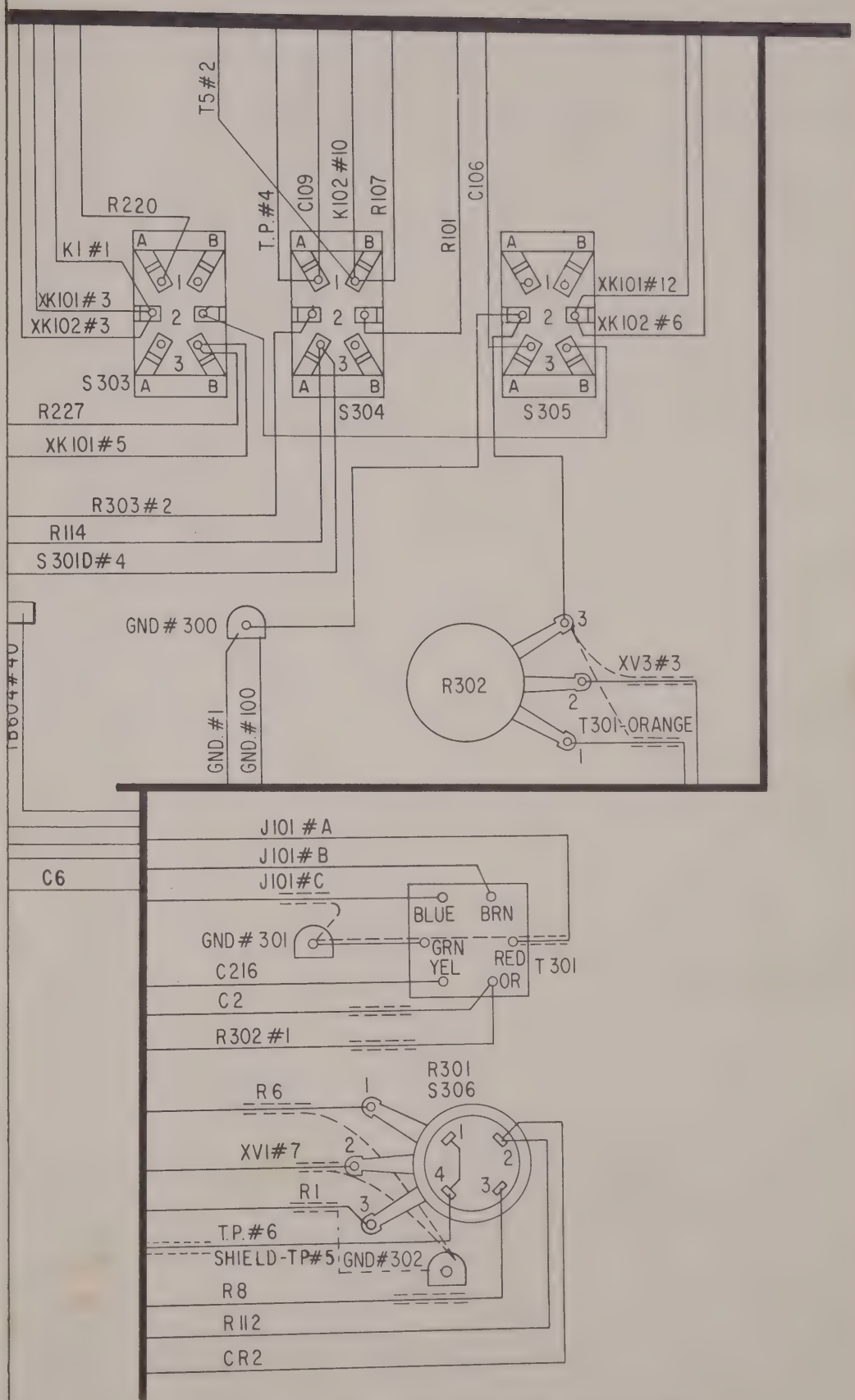


Figure 6–26. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, Control Chassis



-27. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, Control Panel

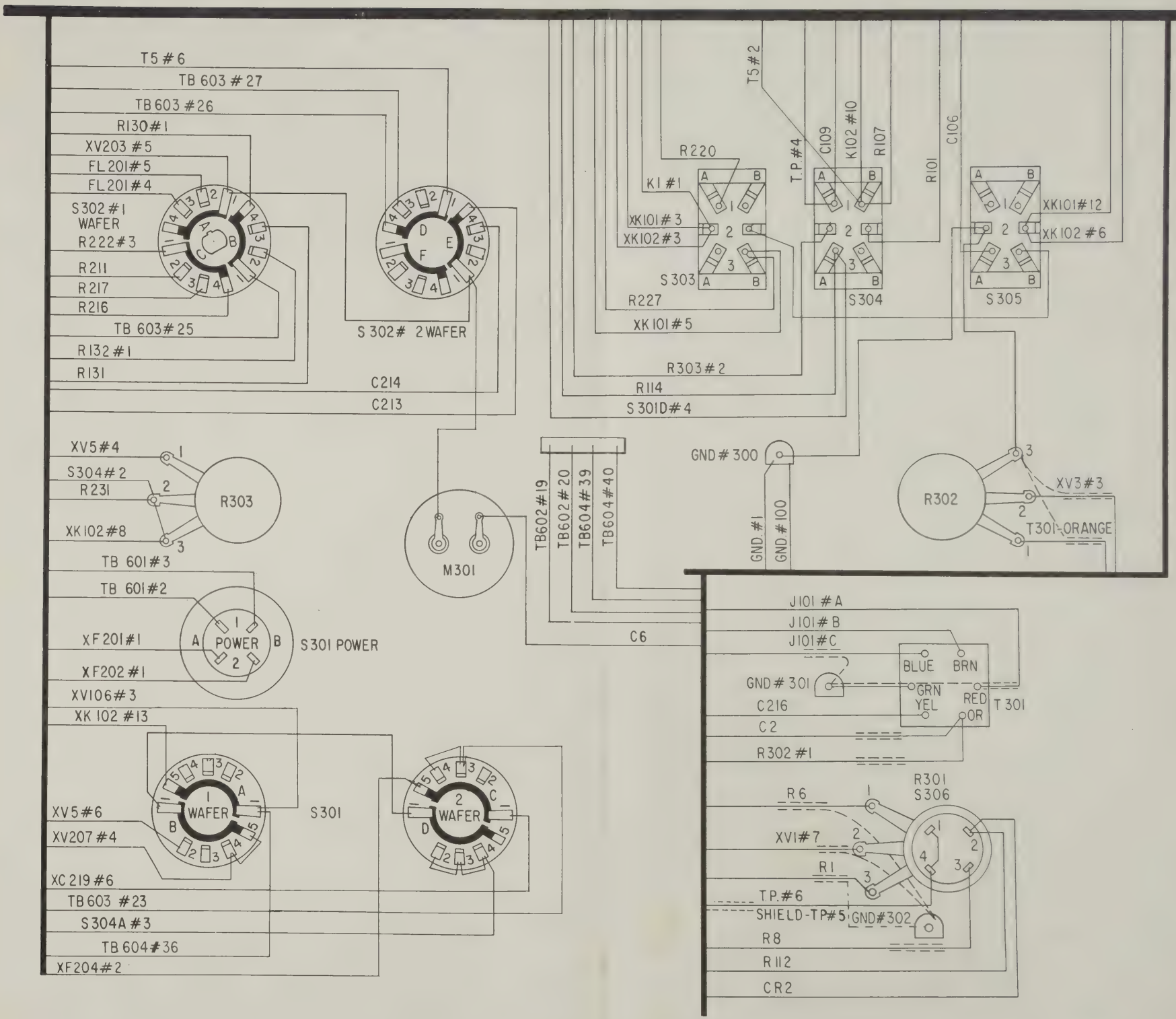
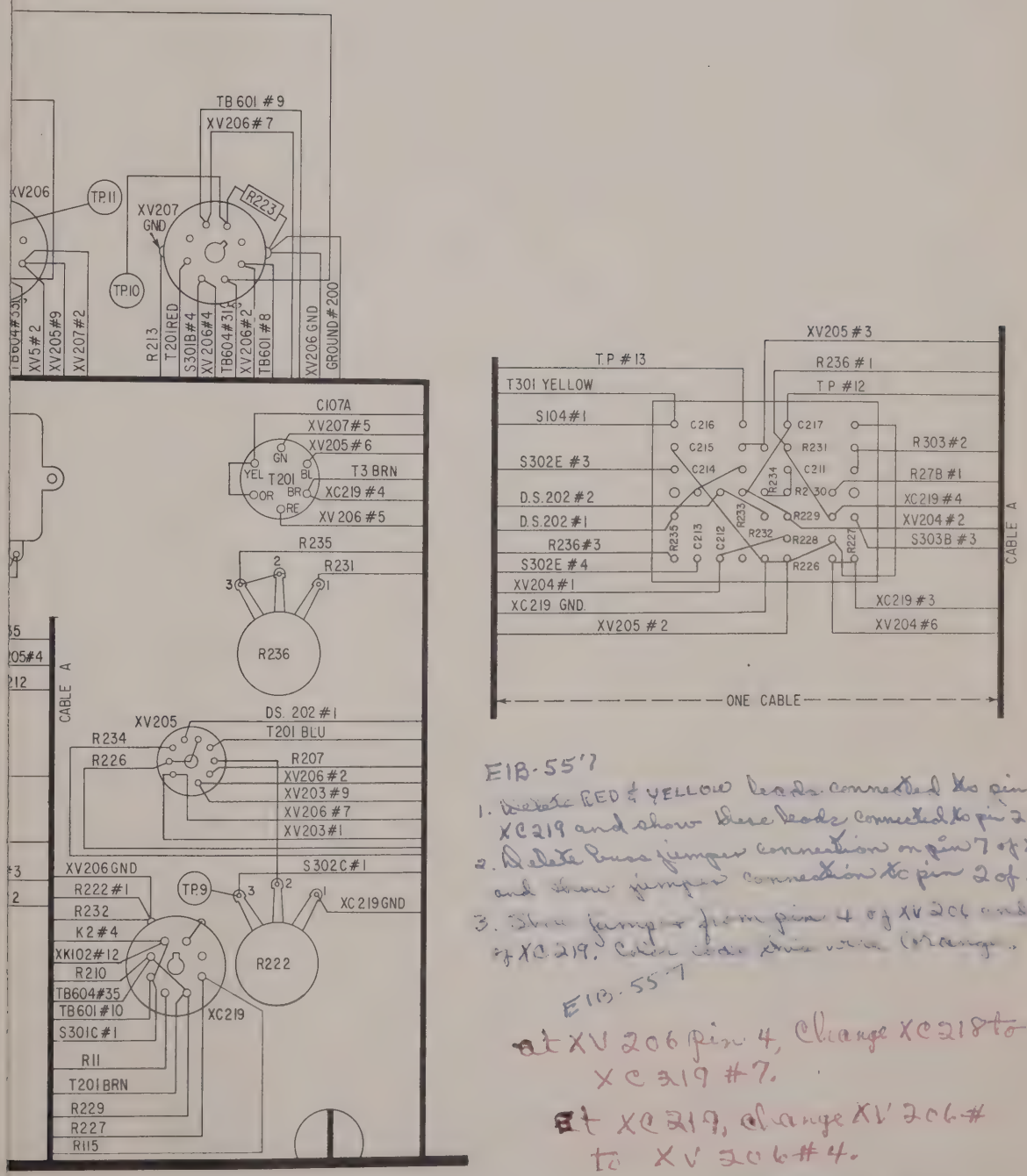


Figure 6–27. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, Control Panel



EIB-55'7

1. Delete RED & YELLOW leads connected to pin 7 of XC219 and show these leads connected to pin 2 of XC2
2. Delete brass jumper connection on pin 7 of XC 219 and show jumper connection to pin 2 of XC219
3. Show jumper from pin 4 of XV 206 and pin of XC 219. Color lead wire used (Orange).

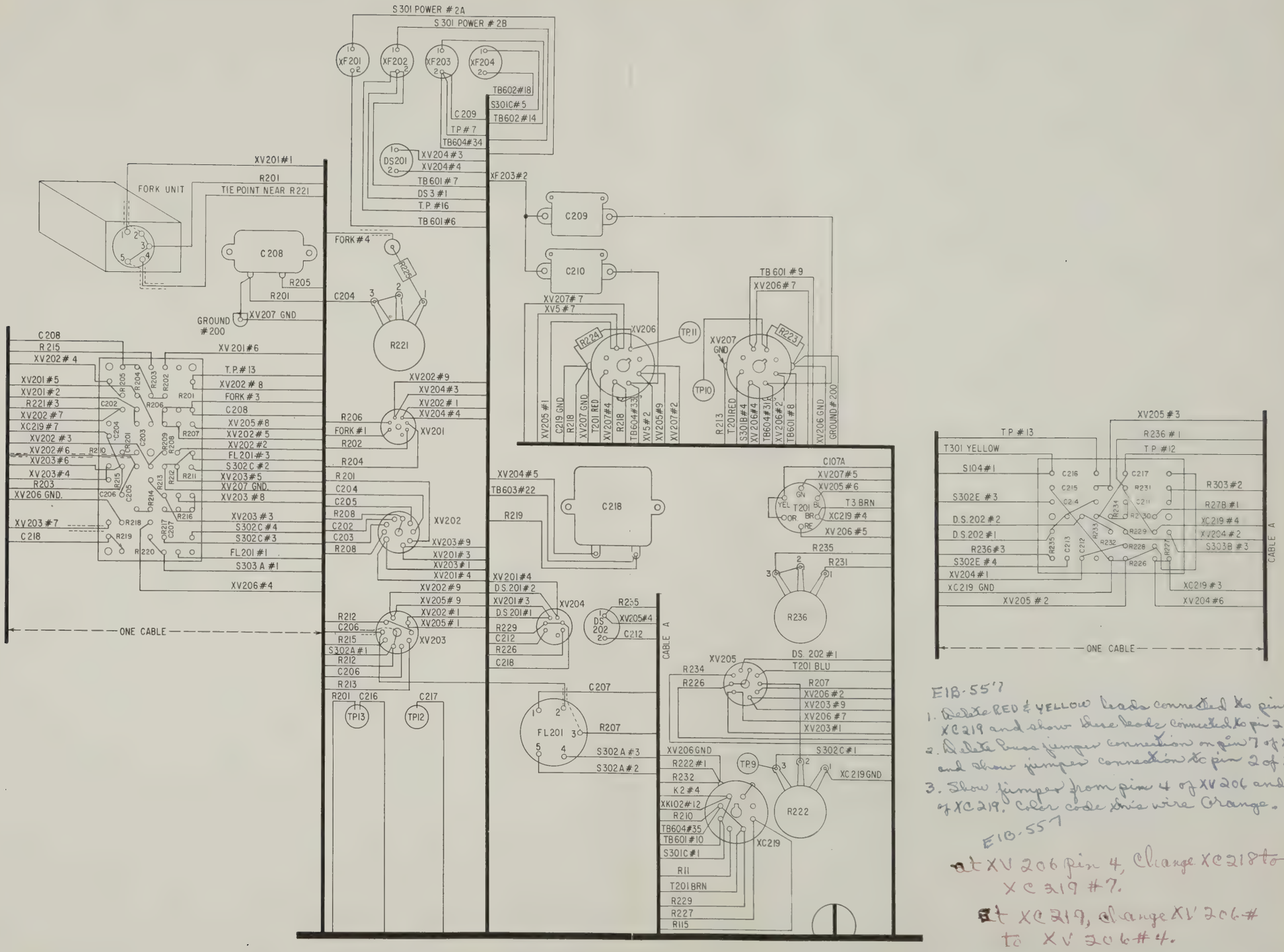
EIB-55'7

at XV 206 pin 4, change XC218 to XC219 #7.

at XC219, change XV 206# to XV 206#4.

T-3

–28. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, Fork and Motor Drive Circuit



E1B-55'7

1. Delete RED & YELLOW leads connected to pin 7 of XC219 and show these leads connected to pin 2 of XC219.
2. Delete brass jumper connection on pin 7 of XC 219 and show jumper connection to pin 2 of XC219.
3. Show jumper from pin 4 of XV 206 and pin 7 of XC219. Color code this wire Orange.

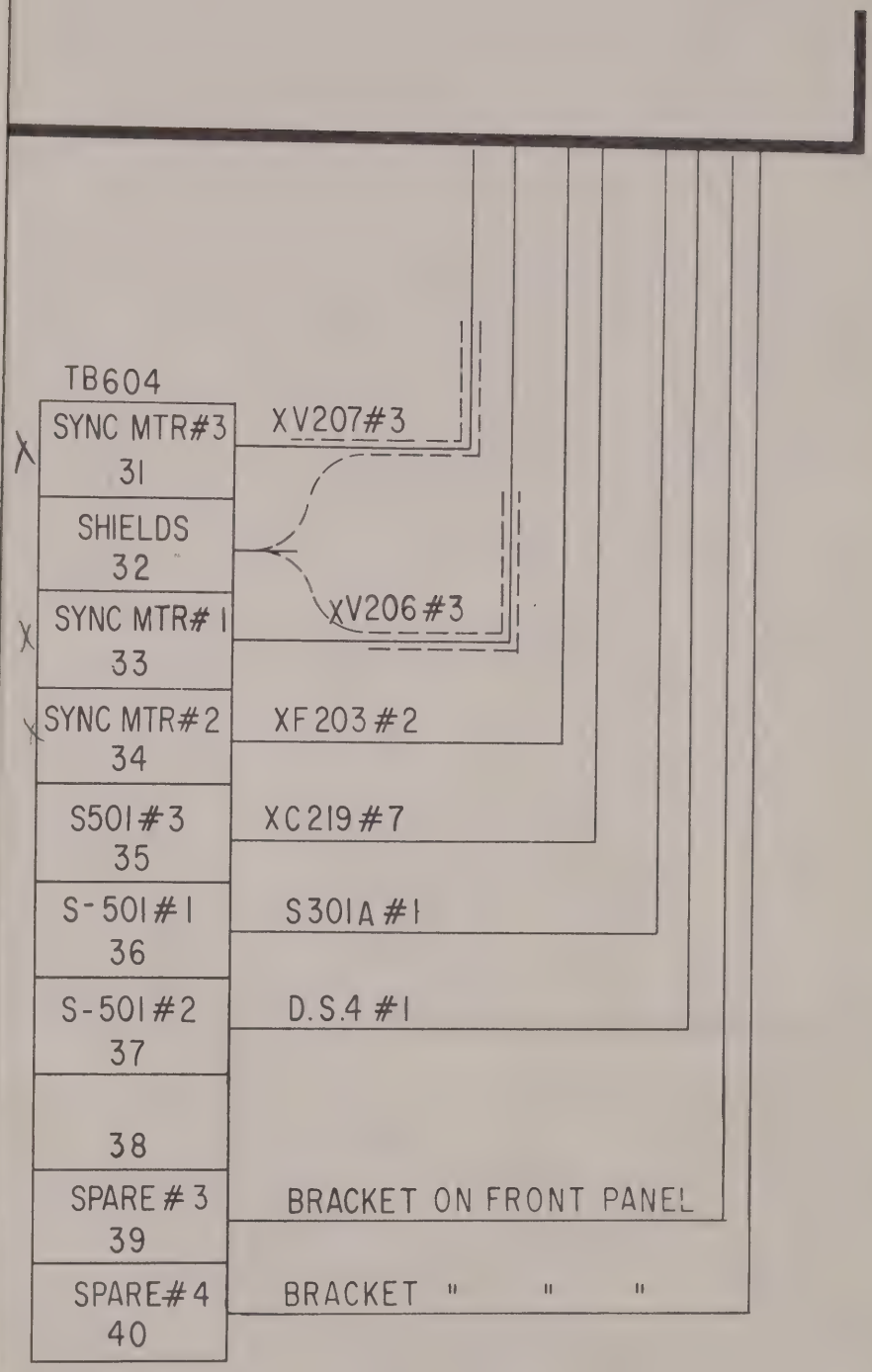
E1B-55'7

at XV 206 pin 4, change XC218 to XC 219 #7.

at XC 219, change XV 206# to XV 206#4.

T-3

Figure 6–28. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, Fork and Motor Drive Circuit



mile AN/UXH-2, Wiring Diagram, Interconnecting Terminal Boards

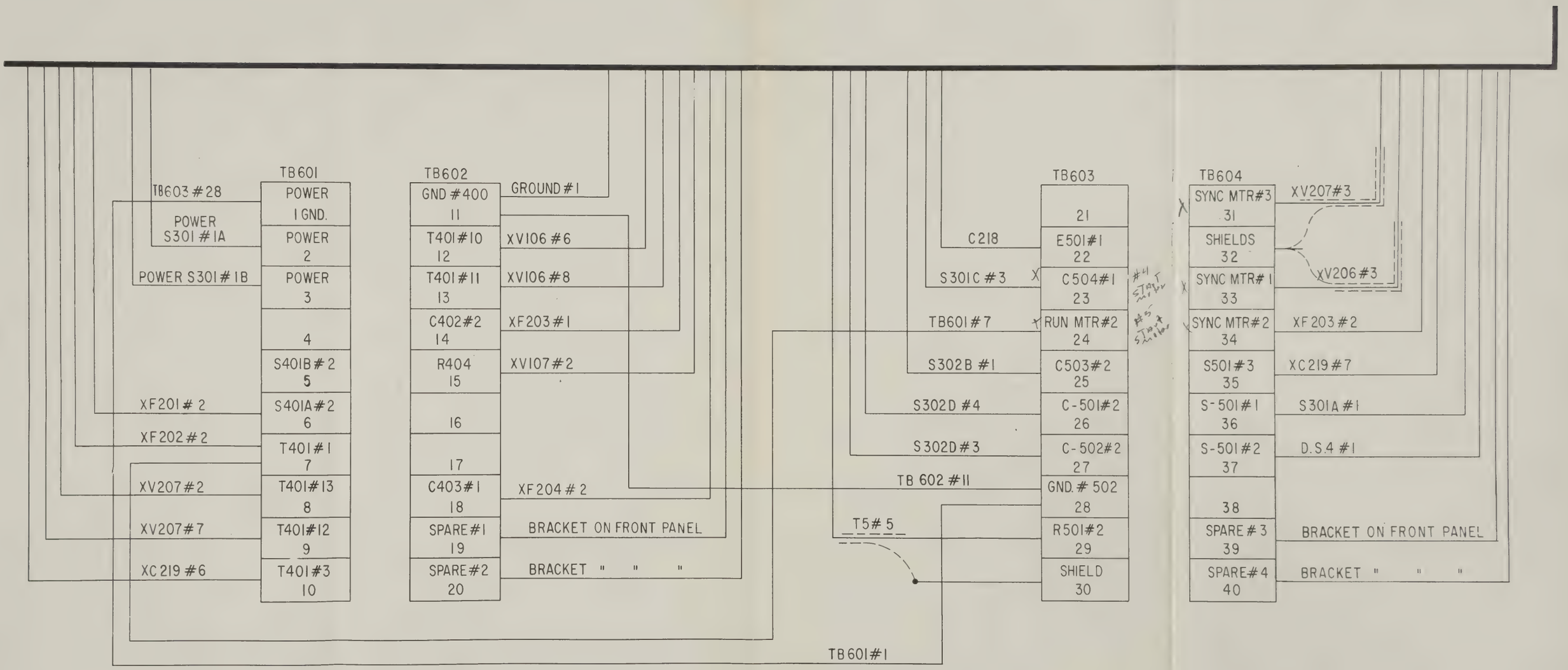


Figure 6–29. Recorder Set, Facsimile AN/UXH-2, Wiring Diagram, Interconnecting Terminal Boards

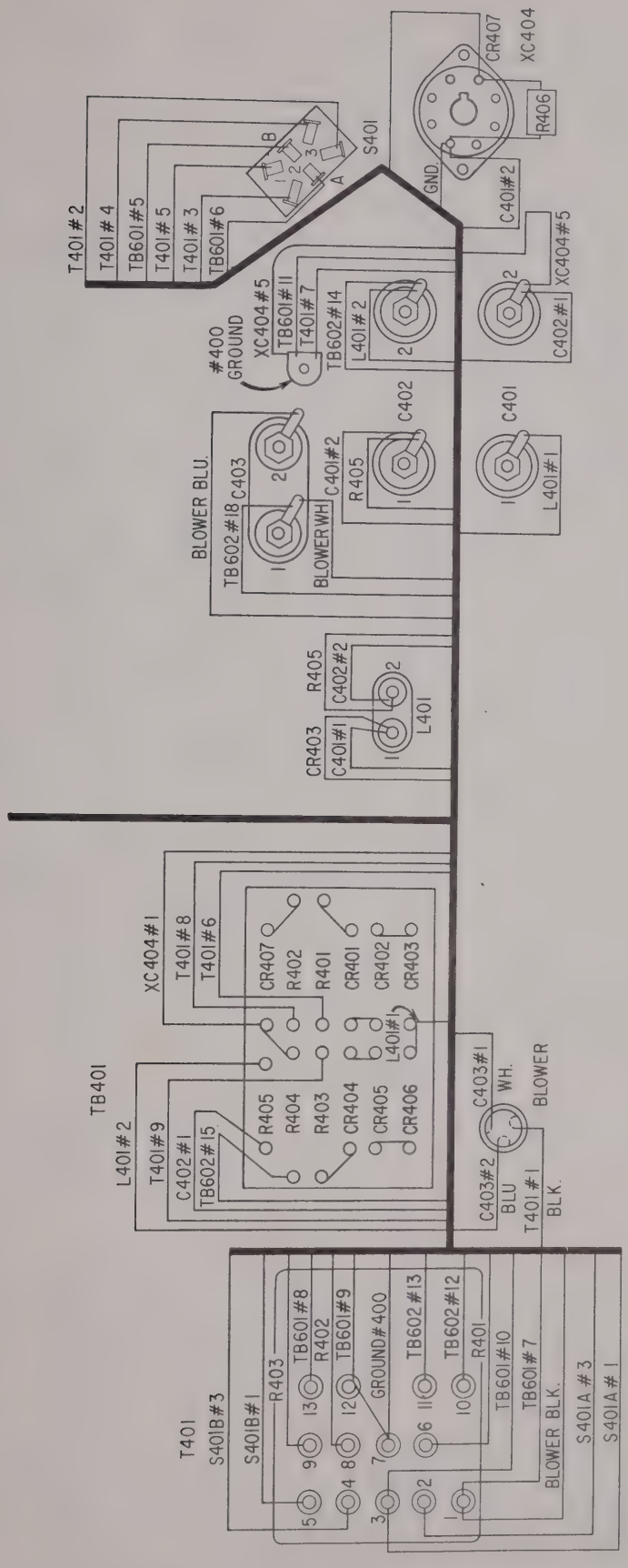


Figure 6–31. Power Supply PP-1901/UXH-2, Wiring Diagram

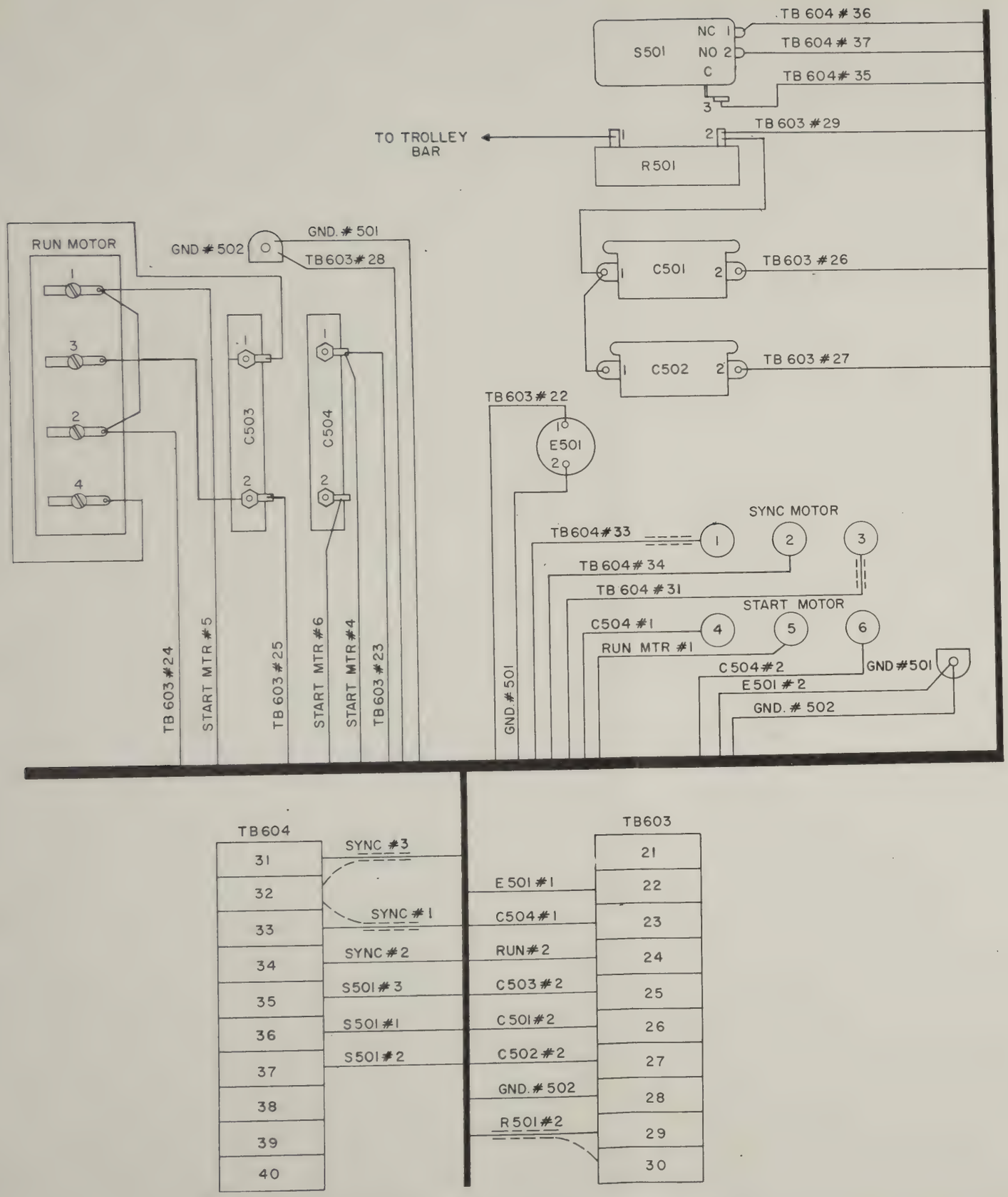


Figure 6–30. Recorder, Facsimile RO-76/UXH-2, Wiring Diagram

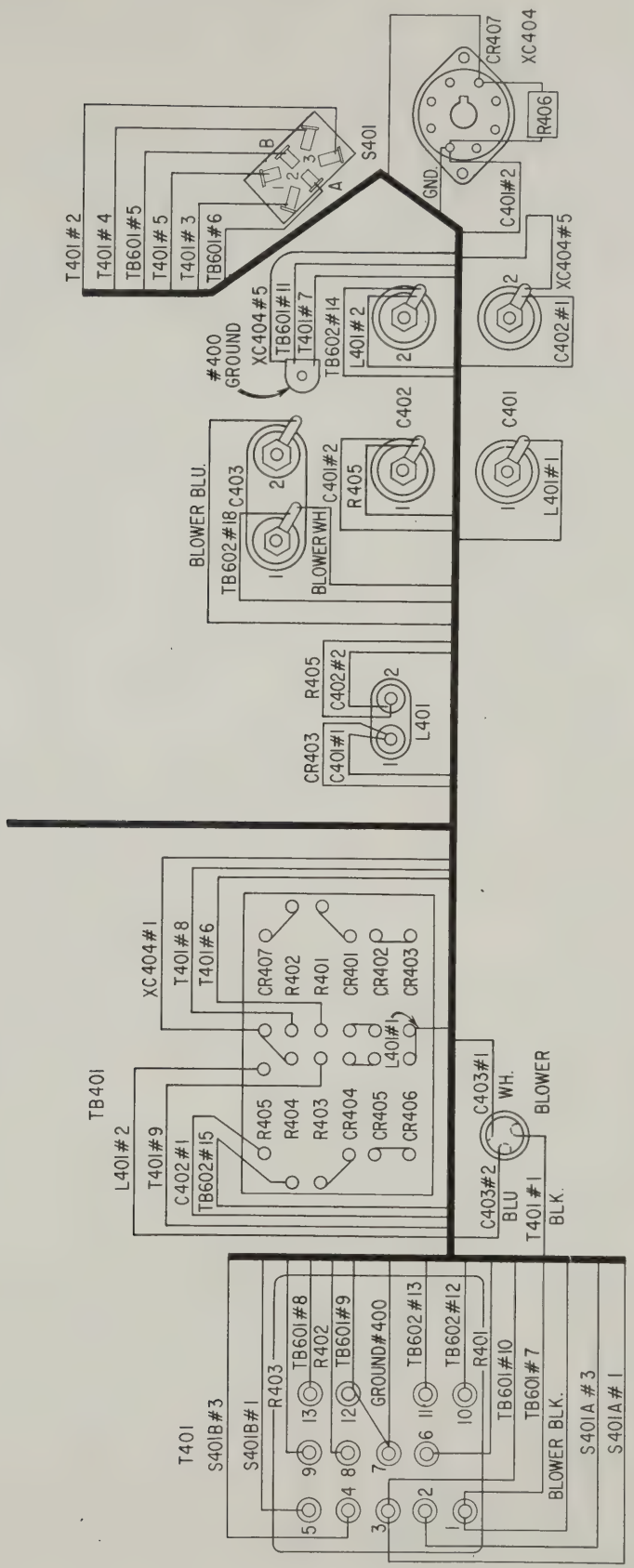


Figure 6–31. Power Supply PP-1901/UXH-2, Wiring Diagram

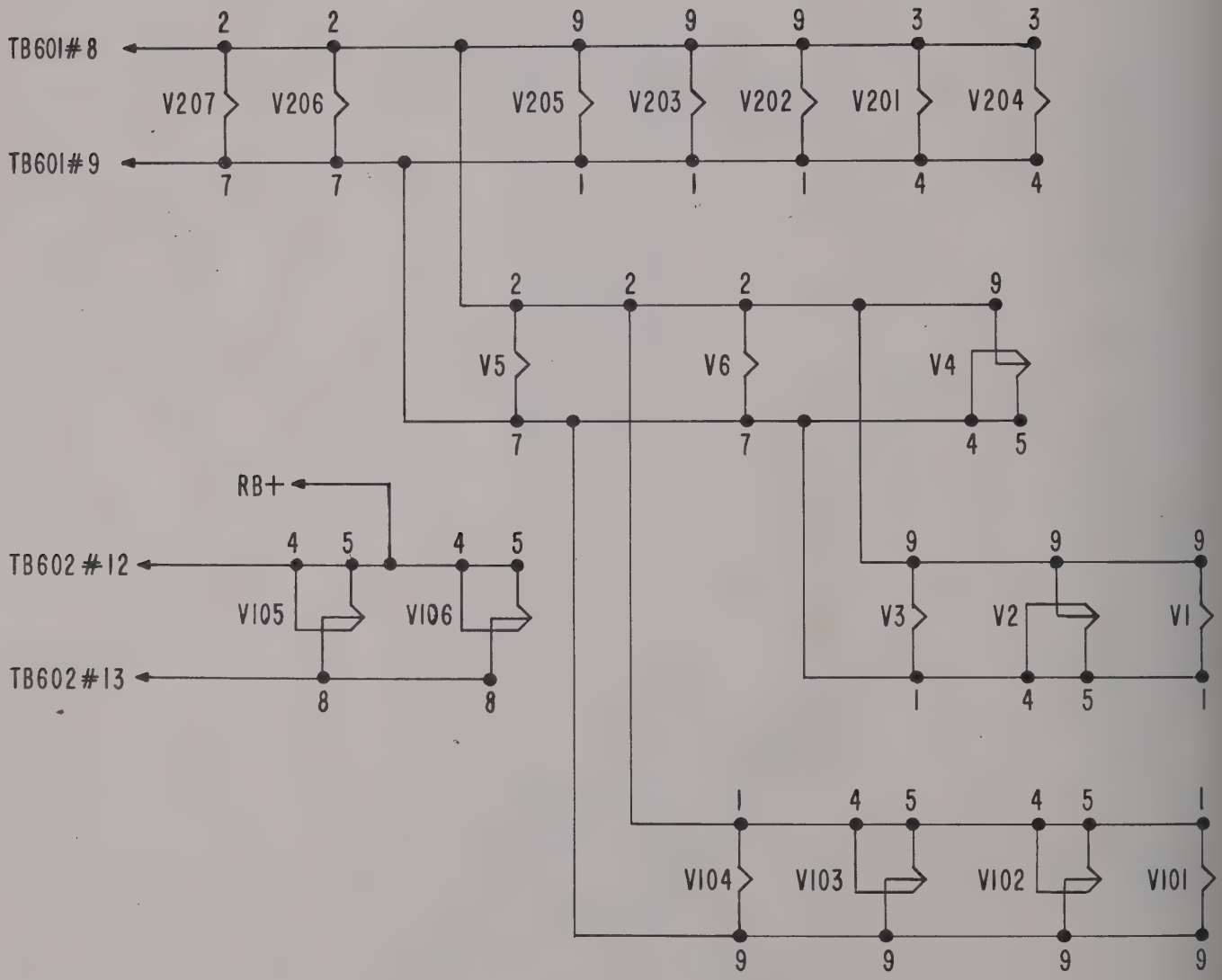


Figure 6–32. Recorder Set, Facsimile AN/UXH-2, Filament Wiring Schematic Diagram

SECTION 7
PARTS LIST

7–1. INTRODUCTION.

Reference designations have been assigned to identify all maintenance parts of the equipment. Electrical components are identified by these symbols marked on the chassis adjacent to the part to which the designation refers. The reference designations of mechanical parts are included on the illustrations. The name, description, function and stock number of all parts to which reference designations have been assigned are included in the parts lists that follow in this section.

The reference designation consists of a letter and a number. This letter indicates the kind of part (generic group) such as resistor, capacitor, mechanical part, etc. The number differentiates between parts of the same generic group, and also is a key to the location of the part as follows: 0 to 99 numbers are in the amplifier section, 100 to 199 numbers are on the hinged panel, 200 to 299 numbers are in the fork and motor drive circuit, 300 to 399 numbers are on the control panel, 400 to 499 numbers are in the power supply, 500 to 599 numbers are on the mechanical unit, and 600 to 699 numbers are on the cabinet.

7–2. MAINTENANCE PARTS LIST.

Table 7–1 lists all the major units and their maintenance parts. Column 1 lists the reference designation of the various parts in alphabetical and numerical order. Column 2 refers to the explanatory notes that appear in table 7–5. Column 3 gives the name and a short description of the various parts. Complete information is given for all key parts, for other parts identical to key parts the name and description are omitted and reference is made to the key part for the data. Column 4 indicates how the part is used, giving the functional location in the equipment, and also includes the figure number of the illustration on which the part is identified.

7–3. STOCK NUMBER IDENTIFICATION.

Table 7–2 is arranged by key designation. The "Stock Number" column gives the stock numbers that have been assigned up to the time of publication of this manual for the various key parts. Therefore, if you have the reference designation for a part, find the reference designation of its key part from table 7–1 before using table 7–2. Table 7–3, Stock Number Cross Reference, lists by stock numbers all key parts that have been assigned stock numbers. If the stock number of a part used in the equipment is known, this table can be used to locate the description of the part in table 7–1.

7–4. LIST OF MANUFACTURERS.

Table 7–4 lists the manufacturers of parts used in the equipment according to the abbreviations used in table 7–1 to identify the manufacturers.

7–5. NOTES.

The notes listed in table 7–5 provide additional information about items listed in table 7–1.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
A601		PLATE ASSEMBLY HOSE: c/o plate and adapter; steel; two ¼ in. dia mtg holes on 4⅞ in. centers; 5⅜ in. lg. 4¾ in. wide, 1/16 in. thick overall; TFC part/dwg 183-00-30-00.	Accessory item. Mounts onto rear of cabinet to serve as an adapter for 10 ft. exhaust hose MP110 when used in place of canister assembly FL606.
B401		BLOWER ASSEMBLY, AN/UXH: c/o blower, blower mounting bracket assembly, adapter assembly, 2 ea 6-32 x ⅜ binding head screws and No. 6 ext lockwashers, and 4 ea 10-32 x ⅜ screws and No. 4 lockwashers; motor complies with MIL-M-17059(2) Service A, blower to Federal spec R-QQ-Z-325; TFC part/dwg 184-50-00-00.	Blower motor. Fig. 5–9.
B501		SYNC MOTOR ASSEMBLY, COMPLETE: c/o 1 ea coil end bell assembly, rear bell assembly, sync motor shaft assembly (p/o MP104), start rotor assembly (B503), left hand helical 116-tooth gear (p/o MP104), thrust spring (MP107), and 4/0 x ⅝ taper pin (p/o MP104), 2 ea decoupling studs (H535), decoupling springs (MP106), retainers (H507), and bearings (MP105), four 6-32 x 2 screws and 6 No. 6 split washers; sync motor is phonic wheel, variable reluctance type, 2-phase, continuous duty; 5/32 in. lg, 4¼ in. wide, 4½ in. deep overall; TFC part/dwg 182-06-00-00.	Sync motor, start rotor and helical gear. Fig. 4–12, 6–14.

TABLE 7—1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
B502		MOTOR, CONTROL: designed for ac; main field data; 115 v, .12 amp, 60 cps; control field data: 115 v, .12 to .15 amp, 767 ohms impedance; 5.4 in. oz. stalled torque; 3500 rpm no-load rotor speed; single take-off shaft; 5 watts output; four .193 in. dia mtg holes on 2.437 in. dia circle parallel to shaft axis; 3⅛ in. lg excl shaft, 2⅜ in. wide, 2 13/16 in. high, shaft extends 25/32 in. from end of enclosure; Navy Servo Motor type CDA211052 w/shaft modified as per TFC dwg; DMC part no. FPE 25-11 (outline dwg 4-A-369) with shaft modified as per TFC dwg; TFC part/dwg 182-17-01-05.	Run motor. Fig. 4—13, 6—9.
B503		Part of B501	Start rotor. Fig. 6—14.
B504		STATOR ASSEMBLY: rated at 1725 rpm; 115 vac, 60 cycle, single phase; BEC Stator Assembly NCI-12 with housing removed; TFC part/dwg 182-06-03-02.	Start stator in rear bell of sync motor B501. Fig. 6—14.
C1		CAPACITOR, FIXED, PAPER DIELECTRIC: .1 mfd ±10%, 200 vdc; MIL type CP05A1EC104K; TFC part 003/CP10404.	T1 to V1B coupling. Fig. 6—25.
C2		CAPACITOR, FIXED, PAPER DIELECTRIC: .01 mfd ±10%, 400 vdc; MIL type CP05A1EE103K; TFC part 003/CP10305.	T301 to R6 coupling. Fig. 6—25.
C3		CAPACITOR, FIXED, PAPER DIELETRIC: .47 mfd ±10%, 100 vdc; MIL type CP05A1EB47K; TFC part 003/CP47401.	R7 to R8 bypass. Fig. 6—25.
C4		CAPACITOR, FIXED, PAPER DIELECTRIC: .47 mfd ±10%, 200 vdc; MIL type CP05A1EC474K; TFC part 003/CP47402.	V2B cathode blocking. Fig. 6—25.
C5		Same as C2.	V3A, V3B coupling. Fig. 6—25.
C6		Same as C2.	M1 blocking. Fig. 6—25.
C7		CAPACITOR, FIXED, PAPER DIELECTRIC: .5 mfd ±10%, 600 vdc; MIL type CP53B1EF504K; TFC part 003/CP50405.	V5, V6 bypass. Fig. 6—25.
C8		Same as C7.	V3 decoupling. Fig. 6—25.
C9		CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 15 mfd, 15 vdc; MIL type CL44BE150TP; TFC part 003/CL15001.	V4A cathode bypass. Fig. 6—25.
C101		Same as C4.	V103A, V103B coupling. Fig. 6—26.
C102		Same as C9.	V101A cathode bypass. Fig. 6—26.
C103		Same as C1.	V101B, V102A coupling. Fig. 6—26.
C104		Same as C9.	Bias supply filter. Fig. 6—26.
C105		CAPACITOR, FIXED, ELECTROLYTIC: tantalum; 50 mfd, 60 vdc; MIL type CL44BK500SP; TFC part 003/CL50001.	Bias supply filter. Fig. 6—26.
C106		Same as C2.	FL102, FL103 coupling Fig. 6—26.
C107	(1)	CAPACITOR, FIXED, PAPER DIELECTRIC: 2 x .5 mfd. +20% −10%, 600 vdc; MIL type CP61B6EF504V; TFC part 003/CP50406.	A-Bias No. 4 bypass. B-V102A grid bypass. Fig. 6—26.
C108		CAPACITOR, FIXED, PAPER DIELECTRIC: .5 mfd ±10%, 600 vdc; MIL type CP61B1EF504K; TFC part 003/CP50404.	V101A, V102B coupling. Fig. 6—26.
C109		Same as C108.	V102B plate feedback. Fig. 6—26.
C110		CAPACITOR, FIXED, PAPER DIELECTRIC: 2 x .25 mfd. +20% −10%, 600 vdc; MIL type CP61B6EF254V; TFC part 003/CP25404.	A-V102B filter. B-V102B grid bypass. Fig. 6—26.
C111		Same as C108.	V105, V106 cathode bypass. Fig. 6—26.
C112		CAPACITOR, FIXED, MICA DIELECTRIC: .0001 mfd ±5%, 300 vdc; MIL type CM15C101J; TFC part 003/CM10101.	V104 plate bypass. Fig. 6—26

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
C201		Not used.	
C202		Same as C1.	V202A to R221 feedback. Fig. 6–28.
C203		CAPACITOR, FIXED, MICA DIELECTRIC: .01 mfd ±10%, 300 vdc; MIL type CM35C103K; TFC part 003/CM10302.	V201, V202A coupling. Fig. 6–28.
C203		CAPACITOR, FIXED, MICA DIELECTRIC: .01 mfd ±10%, 300 vdc; MIL type CP05A1EB104K; TFC part 003/CP10406.	CR201 to R221 blocking. Fig. 6–28.
C205		Same as C2.	V202A, V203A coupling. Fig. 6–28.
C206		CAPACITOR, FIXED, PAPER DIELECTRIC: .047 mfd ±10%, 400 vdc; MIL type CP05A1EE473K; TFC part 003/CP47302.	V203A, V203B coupling. Fig. 6–28.
C207		Same as C2.	FL201, R222 coupling. Fig. 6–28.
C208		Same as C7.	V201, V202 decoupling. Fig. 6–28.
C209		CAPACITOR, FIXED, MICA DIELECTRIC: .00051 mfd +5%, 2500 vdc; MIL type CM45B511J; TFC part 003/CM51103.	V207 plate bypass. Fig. 6–28.
C210		Same as C209.	V206 plate bypass. Fig. 6–28.
C211		Same as C2.	R231, R234 coupling. Fig. 6–28.
C212		Same as C2.	DS202, V204 coupling. Fig. 6–28.
C213		CAPACITOR, FIXED PAPER DIELECTRIC: .15 mfd ±10%, 400 vdc; MIL type CP05A1EE154K; TFC part 003/CP15401.	60 cps charge time for V205. Fig. 6–28.
C214		Same as C206.	90 cps charge time. Fig. 6–28.
C215		CAPACITOR, FIXED, PAPER DIELECTRIC: .002 mfd ±5%, 500 vdc; MIL type CM30D202J; TFC part 003/CM20201.	V205 grid bypass. Fig. 6–28.
C216		CAPACITOR, FIXED, MICA DELECTRIC: .001 mfd ±10%, 300 vdc; MIL type CM20C102K; TFC part 003/CM10204.	Take-off, V202B to test circuit. Fig. 6–28.
C217		Same as C2.	V204 cathode bypass. Fig. 6–28.
C218		CAPACITOR, FIXED, PAPER DIELECTRIC: 1 mfd ±10%, 400 vdc; MIL type CP53B1KE105K; TFC part 003/CP10504.	V204 to E501 blocking. Fig. 6–28.
C219		CAPACITOR, FIXED, ELECTROLYTIC: dry, polarized, plug-in type; 3 x 40 mfd, 250 vdc; MIL type CE53C400M; TFC part 003/CE40601	A-V204 plate bypass. B-B+ bypass for ALC stage. C-RB+ filter. Fig. 6–28.
C220		Capacitor, fixed ceramic dielectric, .001 mfd ±20%, 500 VDC, MIL type CKR-CAW152M, TFC part 003/CC10212	
C401		CAPACITOR, FIXED, PAPER DIELECTRIC: 4 mfd ±10%, 1000 vdc; MIL type CP70E1EG405K; TFC part 003/CP40502.	Power supply filter. Fig. 5–10.
C402		Same as C401.	Power supply filter. Fig. 5–10.
C403		CAPACITOR, FIXED, PAPER DIELECTRIC: 4 mfd ±10%, 600 vdc; MIL type CP70E1EF405K; TFC part 003/CP40501.	Blower motor capacitor. Fig. 5–10.
C404		CAPACITOR, FIXED, ELECTROLYTIC: polarized, plug-in type; 40 mfd, 450 vdc; MIL type CE51F400R with vinyl coating; TFC part/ dwg 181-00-00-37.	Bias supply filter. Fig. 5–10.
C501		CAPACITOR, FIXED, MICA DIELECTRIC: .0051 mfd ±5%, 1200 vdc; MIL type CM50B512J; TFC part 003/CM51203.	60 scans bypass for T5. Fig. 6–30.
C502		CAPACITOR, FIXED, MICA DIELECTRIC: .001 mfd ±5%, 1200 vdc; MIL type CM45B102J; TFC part 003/CM10205.	90 scans bypass for T5. Fig. 6–30.
C503		Same as C403.	Run motor capacitor. Fig. 6–9.
C504		Same as C403.	Start motor capacitor. Fig. 6–9.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
C505		CAPACITOR, FIXED, CERAMIC DIELECTRIC: feed-through type; 100 mmfd +80% −20%, 100 vdc; MIL type CK70A101X; TFC part 003/CC10102.	Trolley bar bypass. Fig. 4–15.
C506		Same as C505.	Trolley bar bypass. Fig. 4–15.
C507		Same as C505.	Trolley bar bypass. Fig. 4–15.
C601		CAPACITOR, FIXED, CERAMIC DIELECTRIC: feed-through type; 10mmfd ±20%, 1000 vdc; MIL type CK70A100M; TFC part 003/CC10001.	Input signal leads bypass.
C602		Same as C601.	Input signal leads bypass.
C603		Same as C601.	Input signal leads bypass.
CR1		SEMI-CONDUCTOR DEVICE: silicon junction diode; type 1N218; max reverse working voltage 220 v; Zenner breakdown voltage 250 v @ .1 milliampere; HSC type 1N218; TFC part 005/V000211.	ALC circuit voltage rectifier. Fig. 6–25.
CR2		Same as CR1.	ALC circuit voltage limiter. Fig. 6–25.
CR101		Same as CR1.	V102A signal rectifier. Fig. 6–26.
CR102		Same as CR1.	V102B signal rectifier. Fig. 6–26.
CR103		Same as CR1.	V102B signal rectifier. Fig. 6–26.
CR104		Same as CR1.	V101A signal detector. Fig. 6–26.
CR105		Same as CR1.	V103 signal rectifier. Fig. 6–26.
CR106		Same as CR1.	V103 signal rectifier. Fig. 6–26.
CR107		SAME AS CR1. STOPS 5601 CURRENT SURGE.	
CR201		SEMI-CONDUCTOR DEVICE: silicon junction diode; type 1N204; max reverse working voltage 15 v; Zenner breakdown voltage 17 v @ .2 milliamperes; HSC type 1N204; TFC part 005/V000197.	Signal rectifier for fork. Fig. 6–28.
CR401		SEMI-CONDUCTOR DEVICE: silicon junction (power type); type 1N1095; 500 v max peak inverse voltage; 350 v max alowable RMS; 750 milliamperes max DC output @ 50°C; +150°C to −65°C operating temp; GE type 1N1095; TFC part 005/V000124.	Power rectifier. Fig. 5–10.
CR402		Same as CR401.	Power rectifier. Fig. 5–10.
CR403		Same as CR401.	Power rectifier. Fig. 5–10.
CR404		Same as CR401.	Power rectifier. Fig. 5–10.
CR405		Same as CR401.	Power rectifier. Fig. 5–10.
CR406		Same as CR401.	Power rectifier. Fig. 5–10.
CR407		Same as CR401.	Bias rectifier. Fig. 5–10.
DS1		LAMP, GLOW: 1/25 w; 65 vac, 90 vdh striking voltage; 200,000 ohm external resistor required for 105-125 v operation; GE No. NE51; TFC part 005/V000143.	STAND BY indicator. Fig. 6–25.
DS2		Same as DS1.	PHASE indicator. Fig. 6–25.
DS3		Same as DS1.	RECORD indicator. Fig. 6–25.
DS4		Same as DS1.	END-OF-PAPER indicator. Fig. 6–25.
DS201		LAMP, INCANDESCENT: 6-8 v., .15 amp, T-3¼ bulb; type #47 (GE); MIL type MS15571-2; TFC part 005/V000156.	POWER ON indicator. Fig. 6–28.
DS202		Same as DS1.	Thyratron to fire V204. Fig. 6–28.
E1		SHIELD, OCTAL TUBE: cylindrical shape; 3⅛ in. high x 1⅝ in. dia overall; IER cat. No. T112031H; TFC part/dwg 181-00-00-15.	Shield for V5, V6, V105, V106.

TABLE 7—1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
E2		Same as E1.	Shield for V6.
E3		Same as E1.	Shield for V206.
E4		Same as E1.	Shield for V207.
E501		ELECTROMAGNETIC ACTUATOR ASS'Y: c/o 1 ea terminal board assembly, phase magnet spring (MP112), adjustable pivot (H541), adjustable screw (H542), lead insulator, phase magnet frame assembly, phase magnet coil assembly, armature assembly, 8-32 x 3/8 shcp set screw, 6-32 hex nut and No. 6 external lock washer, and two 2-56 x 1/8 brass fh screws; TFC part/dwg 182-36-00-00.	Phase magnet. Fig. 6—13.
E502		MOTOR COIL AND INSULATOR ASSEMBLY: c/o sync coil assembly, cut wire, and insulator; TFC part/dwg 182-00-00-62.	P/o sync motor B501. Fig. 6—15.
E503		Not used.	
E504		INSULATOR: type LTS-E2 bakelite per JAN-P-13; 9/32 in. dia hub, 1/16 in. lg; 1/2 in. dia shoulder, 1/8 in. lg; .152 in. ID, 1/2 in. OD, 3/16 in. lg overall; TFC part/dwg 90-06-01-74.	Insulators for R501.
F201		FUSE, CARTRIDGE: 5 amps, 250 v; type ~~F03G5R00A~~ F03A250V5AS per MIL-STD-~~242A~~; MS no. MS90079-3-1; TFC part/dwg 181-00-00-27.	LINE fuse for 110-volt operation. Fig. 6—28.
F202		Same as F201. F-15160/03A	LINE fuse for 110-volt operation. Fig. 6—28.
alternate F201		FUSE, CARTRIDGE: 3 amps, 250 v; type ~~E03G3R00A~~ F03A250V3AS per MIL-STD-~~242A~~; MS No. MS90079-2-1; TFC part/ dwg 181-00-00-26. F-15160/03A	LINE fuse for 220-volt operation.
alternate F202		Same as alternate F201.	LINE fuse for 220-volt operation.
F203		FUSE, CARTRIDGE: 0.30 amp, 500 v; .406 in. dia, 1 1/2 in. lg overall; silver plated ferrule terminals; BMC type KLM; TFC part/dwg 181-00-00-25.	B+ fuse. Fig. 6—28.
F204		FUSE, CARTRIDGE: 1.0 amp, 250 v; type F03G1R00B per MIL-STD-242A; MS No. MS90079-20-1; TFC part/dwg 181B-00-00-28.	BLOWER motor fuse. Fig. 6—28.
F601		FUSE, CARTRIDGE: 10 amps, 250 v; type ~~F03G10R0A~~ F03A250V10AS per MIL-STD-~~242A~~; MS No. 90079-5-1; TFC part/dwg 181-00-00-33.	Accessory outlet fuse.
FL101		FILTER, BAND PASS: 60 cps operating frequency; type FR1A22YY per MIL-F-18327 (Ships); TFC part/dwg 181-11-04-00. F-15160/03A	Start record signal filter. Fig. 6—26.
FL102		TUNED CIRCUIT: 450 cps and 300 cps operating frequencies; c/o 2 capacitors and 1 coil; coil and 1 capacitor parallel resonate across term 1 and 2 (term 3 unconnected) at 450 ±5 cps, coil and 2 capacitors parallel resonate across term 1 and 2 (term 2 and 3 connected externally) at 300 ±3 cps; 100,000 to 250,000 ohms impedance; three terminals; four 6-32 x 15/32 in. mtg studs on 1 3/8 by 1 1/4 in. mtg centers; 1 15/16 in. wide, 1 13/16 in. deep, 2 7/16 in. lg overall excl mtg studs and terminals; TFC part/dwg 181-11-05-00.	Start/stop signal tank. Fig. 6—26.
FL103		FILTER, HIGH PASS: typical insertion loss: 0 db @ 2000 cps, -1 db @ 1500 cps, -2 1/2 @ 1200 cps, -5 @ 1000 cps, -9.75 @ 800 cps, -17 1/2 @ 600 cps, -25 1/4 @ 450 cps, and -33.75 db @ 300 cps (ref voltage 10 v across output); input impedance 100,000 ohms, output impedance 47,000 ohms; 3 solder lug terminals; two 6-32 x 15/32 in. lg mtg studs on 1 1/8 x 15/16 in. mtg/c; 1 7/16 in. wide, 1 5/8 in. deep, 2 1/8 in. high excl mounting studs and terminals; TFC part/dwg 181-11-06-00.	Modulation elimination filter. Fig. 6—26.
FL104		Same as FL102	Test signal tank. Fig. 6—26.
FL201		FILTER, BAND PASS: 600, 900 and 1200 cps operating frequencies; c/o 3 capacitors, 1 resistor and a coil; coil and 1st capacitor parallel resonate across term 1 and 3 @ 1200 cps; coil and 1st and 2nd capacitor parallel resonate @ 900 cps, coil and 1st and 3rd capacitor parallel resonate @ 600 cps; 5 solder lug terminals; two 6-32 x 15/32 in. mtg studs on 15/16 x 1 1/8 in. mtg centers; 1 1/2 in. square by 2 1/8 in. high overall excl mtg studs and terminals; TFC part/dwg 181-11-07-00.	Tunes V203 to 600, 900 or 1200 cps. Fig. 6—28.

TABLE 7—1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
FL501		FILTER, AIR: filter frame—No. 20 gage (.032) aluminum 3003 H-14; filter media—14 mesh aluminum wire cloth (5056 clad); 10 in. lg, 5 in. wide, 1 in. thick overall; FAR type A4A4; TFC part/dwg 182-00-00-38.	On mech unit; absorbs dust. Fig. 6—5.
FL601		FILTER, POWER LINE: filter conforms to MIL-F-18344A; contains 4 capacitors and 2 coils; 4 screw-type terminals, 8-32 x 1/4 NC thread; two 3/16 in. dia mtg holes on 2 15/16 in. centers; 3 7/16 in. lg, 3 5/16 in. wide, 7/8 in. thick overall; FIL type FA-2980; TFC part/dwg 181-00-03-02.	Power line filter.
FL602		Same as FL501.	On cabinet bottom; absorbs dust.
FL603		Same as FL501.	On cabinet bottom; absorbs dust.
FL604		Same as FL501.	Used with canister assembly on rear of cabinet. Fig. 3—7.
FL605		CARBON, ACTIVATED: 6/14 mesh; furnished in sealed screw-top cans; net weight of contents 1/2 lb; CCC Activated Carbon Grade AC, 6/14 mesh; TFC part/dwg 130-00-00-04.	Used in canister assembly on rear of cabinet.
FL606		CANISTER ASSEMBLY, COMPLETE: c/o 1 ea canister cover, canister bracket assembly, and 1/8 in. thick rubber gasket, and 2 ea 1/16 in. thick rubber gaskets, 10-24 screw assemblies (H611), canister panels, canister plates, bracket tabs, 6-32 x .085 in. clinch nuts and 6-32 x 3/8 binding head screws; TFC part/dwg 180-00-02-00.	On rear of cabinet, filters air from recorder. Fig. 3—7.
H1		BASE, OCTAL TUBE SHIELD: cylindrical shape; 1 3/4 in. dia by 1 5/16 in. deep overall; IER cat. No. T11-2001; TFC part/dwg 181-00-00-16.	Base for tube shields E1 thru E4.
H2		CLAMP, POTENTIOMETER: for potentiometers with 1/4 in. dia shaft w/ 3/8 x 32 NEF2 threaded bushing; molded nylon w/nickel plated brass insert; 0.630 in. dia. 0.480 in. high overall; RAY cat. No. 231-1142G1; TFC part/dwg 28E-00-00-02.	Lock for potentiometers R27, R126, R130, R131, R132, R221, R222, R236.
H3		RETAINER, TUBE: stainless steel; 11/16 in. between centers of retainer mtg stud and retained object; 1 1/16 in. lg. 13/16 in. wide, 9/16 in. thick overall; TFC part/dwg 002/1010, cat. 1T.	Tube clamp for V1 through V4, V101 through V107, V201 thru V205.
H4		RETAINER, TUBE: stainless steel; 1 1/16 in. between centers of retainer mtg stud and retained object; 2 3/16 in. lg, 1 1/2 in. wide, 11/16 in. thick overall; TFC part/dwg 002/3010, cat. 3T.	Clamp for capacitors C219 and C404.
H5		STUD, PLAIN: stainless steel; 8-32 thread 1 1/4 in. along one end and 1/2 in. along other end; 1 1/2 in. high from mtg surface; 1 7/8 in. lg. 0.142 in. dia overall; TFC part/dwg 002/1702, cat. 17.	Mtg stud for tube clamp for V1, V3, V101, V104, V201, V202, V203, V205.
H6		STUD, PLAIN: stainless steel; 8-32 thread 1 1/2 in. on one end, 1/2 in. along other end; 2 in. high from mtg surface; 2 3/8 in. lg, 0.142 in. dia. overall; TFC part/dwg 002/2302, cat. 23.	Mtg stud for tube clamps for V2, V4, V103, V105, V106, V204.
H101		STUD, PLAIN: stainless steel; 8-32 thread 1 1/2 in. on one end, 1/2 in. along other end; 2 1/2 in. high from mtg surface; supplied with 3/4 in. ID ring; 2 5/8 in. lg, 0.142 in. dia overall; TFC part/dwg 002/2572, cat. 257.	Mtg stud for tube clamp for V107.
H102		STUD, PLAIN: stainless steel; 8-32 thread 1 1/2 in. on one end, 1/2 in. along other end; TFC post No. 23 with 7/8 in. ID ring welded to post 1 3/16 in. from top; 2 in. high from mtg surface; 1.34 in. OD, 2 3/8 in. lg overall; TFC part/dwg No. 002/2392, cat. 239.	Mtg stud for tube clamp for V102.
H201		STUD, PLAIN: stainless steel; 8-32 thread 2 in. on one end, 1/2 in. along other end, 3 7/8 in. high from mtg surface; 4 1/4 in. long, 0.142 in. dia overall; TFC part/dwg 002/4202, cat. 42.	Mtg stud for clamp for C219.
H301		KNOB, CONTROL: part no. 700-4 MIL-STD-242A; 0.703 in. dia, 0.790 in. deep overall; TFC part/dwg 181-00-00-24.	For SPKR VOLUME control R302.
H302		KNOB, CONTROL: with pointer; part no. 700-18S per MIL-STD-242A; CLA cat. no. 90-5-2G; TFC part/dwg 181-00-00-23.	For SCANS/MIN switch S302.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
H303		Same as H301.	For DENSITY control R303.
H304		Same as H302.	For selector switch S301.
H305		Same as H302.	For GAIN control R301.
H401		STUD, PLAIN: stainless steel; 8-32 thread 2 in. on one end, 1/2 in. along other end; 2 7/8 in. high from mtg surface; 3 1/4 in. long, 0.142 in. dia overall; TFC part/dwg 002/3203, cat. No. 32.	For clamp for C404.
H501		RETAINER, RING: beryllium copper; external; for 3/16 in. dia shafts; WKC cat. No. 5100-18C-M1; TFC part/dwg 182-55-00-14.	On 3/16 in. dia shafts.
H502		RETAINER RING: stainless steel; external; for 1/4 in. dia shafts; WKC cat. No. 5100-25W; TFC part/dwg 182-16-00-05.	On 1/4 in. dia shafts. Fig. 6–7, 16, 19.
H503		RETAINER, RING: stainless steel; external, bowed; for 1/4 in. dia shafts; WKC cat. No. 5101-25W; TFC part/dwg 182-16-00-06.	For 1/4 in. dia shafts.
H504		RETAINER, RING: stainless steel; external, crescent shaped; for 1/4 in. dia shafts; WKC cat. No. 5103-25W; TFC part/dwg 182-36-02-02.	For 1/4 in. dia shafts.
H505		RETAINER, RING: stainless steel; external, self-locking type; for 1/4 in. dia shafts; WKC cat. No. 5105-25W; TFC part/dwg 182-36-02-03.	For 1/4 in. dia shafts.
H506		RETAINER, RING: stainless steel; external; for 5/16 in. dia shaft; WKC cat 5100-31W; TFC part/dwg No. 34-06-01-35.	For 5/16 in. dia shafts. Fig. 6–7, 10, 16.
H507		RETAINER, RING: stainless steel; external; for 3/8 in. dia shafts; WKC cat. 5100-37W; TFC part/dwg 182-17-00-06.	For 3/8 in. dia shafts. Fig. 6–7, 12, 16, 20, 23.
H508		RETAINER, RING: stainless steel; external; for 1/2 in. dia shafts; WKC cat. 5100-50W; TFC part/dwg 182-48-00-04.	For 1/2 in. dia shafts. Fig. 6–18.
H509		RETAINER, RING: stainless steel; external; for 5/8 in. dia shafts; WKC cat. 5100-62W; TFC part/dwg 182-00-00-30.	For 5/8 in. dia shafts. Fig. 6–7, 10.
H510		RETAINER RING: stainless steel; external, bowed; for 5/8 in. dia shafts; WKC cat. 5101-62W; TFC part/dwg 182-00-00-05.	For 5/8 in. dia shaft. Fig. 6–10.
H511		RETAINER RING: stainless steel; internal; for 7/8 in. dia bore; WKC cat. 5000-87W; TFC part/dwg 182-17-00-03.	For 7/8 in. dia bore.
H512		RETAINER, RING: stainless steel; internal; for 1 3/8 in .dia bore; WKC cat. 5000-137W; TFC part/dwg 182-26-00-01.	For 1 3/8 in. dia bore.
H513		RETAINER, RING: stainless steel; internal, bowed; for 1 3/8 in. dia bore; WKC cat. 5001-137W; TFC part/dwg 182-26-00-02.	For 1 3/8 in. dia bore.
H514		WASHER, FLAT: nylon; 1.752 in. ID, 2 1/4 in. OD, 3/64 in. thick overall; TFC part/dwg 112-00-06-01.	Sync clutch spacer. Fig. 6–11.
H515		WASHER, FLAT: brass; three .144 in. dia holes 120° apart on 0.781 in. radius, c'sunk for No. 4 flat head screws; 1 1/4 in. ID, 1 15/16 in. OD, 0.064 in. thick overall; TFC part/dwg 112-00-06-22.	Ratchet hub retainer. Fig. 6–11.
H516		RETAINER, SPRING: stainless steel; 23/64 in. lg 1/4 in. dia overall TFC; part/dwg 112-00-06-22.	Sync clutch pawl spring retainer.
H517		SCREW, SHOULDER: stainless steel; 0.249 in. dia rd slotted head, 5/64 in. deep; 0.186 in. dia. shoulder, 0.189 in. deep; 6-32 NC2 thread on end; 1/2 in. lg, 0.249 in. dia overall; TFC part/dwg 112-00-06-23.	Sync clutch pawl screw.
H518		SCREW, SHOULDER: stainless steel; 0.249 in. dia rd. slotted head, 1/16 in. deep; 0.155 in. dia shoulder, 0.158 in. deep; 4-40 NC 2 thread on end; 13/32 in. lg. .249 in. dia overall; TFC part/dwg 112-00-09-01.	Dog latch shoulder screw.
H519		SCREW: head data; 1/4 in. dia, 3/32 in. deep, with medium st knurled band on head and two 1/16 in. dia holes spaced 90° apart, 3/32 in. from top of head; 4-40 thread; 0.089 in. dia, 3/64 in. wide groove 1/8 in. from end; 5/16 in. lg, 1/4 in. dia overall; TFC part/dwg 132-26-00-13.	Sync clutch pawl spring retainer screw.
H520		WASHER, FLAT: stainless steel; 0.390 in. ID, 1/2 in. OD, 0.015 in. thick; TFC part/dwg 182-48-00-06.	For sync shaft and also on durm assembly. Fig. 6-12, 6-18.
H521		WASHER, FLAT: stainless steel; 21/64 in. ID, 1/2 in .OD, 0.032 in. thick; TFC part/dwg 182-00-00-06.	Sync shaft spacer. Fig. 6-10.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
H522		WASHER, FLAT: stainless steel; 0.390 in. ID, 5/16 in. OD, 0.031 in. thick overall; TFC part/dwg 182-00-00-20.	For sync shaft and paper feed cam. Fig. 6–17, 20.
H523		WASHER, SHOULDERED: stainless steel; 0.376 in. ID; shoulder 0.437 in. OD, 1/16 in. thick; 3/4 in. OD, 3/16 in. lg overall; TFC part/dwg 182-55-00-02.	Cone spring seat. Fig. 6–20.
H524		KNOB: round; 3/4 in. dia; with 10-32 tap for shaft; ADC Ball Knob part No. PB-5; TFC part/dwg 182-55-00-05.	For right hand cone clutch. Fig. 6–20.
H525		CLAMP, CLUTCH: stainless steel; round; with 1/16 in. wide slot 1 1/8 in. deep and hole for 6-32 x 3/8 in. socket head cap screw; 1 3/8 in. dia. 11/32 in. thick overall; TFC part/dwg 182-27-00-02.	For run and paper feed clutches. Fig. 6–7, 8, 9, 21.
H526		WASHER, FLAT: stainless steel; 0.189 in. ID, 0.281 in. OD, 0.015 in. thick overall; TFC part/dwg 182-55-04-01.	P/o rear pressure roll assemblies and flywheel assembly.
H527		STUD: stainless steel; 0.186 in. dia head, 37/64 in. deep, with 1/32 in. wide slot 3/16 in. deep; 0.017 in. wide groove 1/16 from one end; 10-32 thread, 5/16 in. along other end; middle section 5/16 in. dia, 11/16 in. lg; 1 53/64 in. lg, 15/16 in. dia overall; TFC part/dwg 182-56-00-06.	For release lever pivot.
H528		STUD, STANDOFF: aluminum; 0.089 in. dia hole 11/32 in. deep with 4-40 tap 9/32 in. deep each end; 1 in. lg, 5/16 in. dia overall; TFC part/dwg 182-56-00-07.	For end of paper switch S501.
H529		WASHER, FLAT: stainless steel; 0.640 in. dia, 7/8 in. OD, 0.062 in. thick overall; TFC part/dwg 182-48-00-05.	For drum shaft. Fig. 6–18.
H530		WASHER, FLAT: stainless steel; 33/64 in. OD, 5/8 in. OD, .015 in. thick overall; TFC part/dwg 182-48-00-07.	Drum clutch key spacer. Fig. 6–18.
H531		WASHER, FLAT: stainless steel; 17/64 in. ID, 11/32 in. OD, 0.031 in. thick overall; TFC part/dwg 182-00-05-04.	Spacer for 18-tooth pressure roller gears.
H532		WASHER, FLAT: stainless steel; 17/64 in. ID, 3/8 in. OD, 0.031 in. thick overall; TFC part/dwg 182-00-05-06.	For pressure roller assemblies. Fig. 6–19.
H533		SCREW, MACHINE: 4-40 x 5/16 binding head set screw with 1/32 in. wide, 33/64 in. lg slot cut in end; stainless steel; TFC part/dwg 182-54-00-02.	Deflector plate short mtg screw.
H534		SCREW, MACHINE: 4-40 x 1/2 binding head set screw with 1/32 in. wide, 3/64 in. lg slot cut in end; stainless steel; TFC part/dwg 182-54-00-01.	Deflector plate long mtg screw.
H535	(2)	STUD, PLAIN: 10-32 threaded stainless steel rod; 0.106 in. dia hole with 6-32 tap; 1/8 in. lg overall; TFC part/dwg 112-06-00-31. For Reference Only.	For sync motor decoupling spring. P/o B501. Fig. 6–14.
H536		RETAINER, SPRING: stainless steel; rectangular shape; 3/8 in. lg, 5/16 in. wide, 3/16 in. thick overall; TFC part/dwg 182-23-00-02.	For flywheel pawl spring. Fig. 6–12.
H537		SCREW, MACHINE: 1/4 in. sq. head, 3/16 in. deep with two 1/16 in. dia holes 90° apart, 3/32 in. from top; 4-40 thread for 1/4 in.; 1/4 in. dia, 9/16 in. lg overall; TFC part/dwg 182-23-00-03.	Flywheel pawl spring clamp screw.
H538		WASHER, FLAT: stainless steel; 0.173 in. ID, 0.249 in. OD, 0.189 in. thick overall; TFC part/dwg 182-23-00-04.	For flywheel assembly.
H539		RETAINER, SPRING: stainless steel; sleeve shape; 0.390 in. ID, 7/16 in. OD, 0.218 in. lg overall; TFC part/dwg 182-00-00-21.	For load spring MP77.
H540		RETAINER, RING: stainless steel; internal; for 5/8 in. dia bore; WKC cat. No. 5000-62W; TFC part/dwg 182-16-00-02.	On sync shaft.
H541		SCREW, SET: stainless steel; 6-32 x 5/8 in. lg slotted head, set screw with 60° point concentric with OD of thread within 0.002 in.; TFC part/dwg 90-06-04-09.	Adjustable pivot for phase actuator; p/o E501. Fig. 6–13.
H542		SCREW SET: stainless steel; hex head 5/16 in. across flats, 3/16 in deep, w/two 1/16 in. wide, 3/32 in. deep perpendicular slots; 6-32 thread, 2 threads from shoulder; rounded end approx 0.069 in. radius; 1/2 in. lg excl head; 11/16 in. lg, 5/16 in. dia overall; TFC part/dwg 90-06-04-10.	Adjustable back stop screw for phase actuator; p/o E501. Fig. 6–13.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
H543		WASHER, FLAT: stainless steel; three 0.169 in. dia holes equally spaced on 2 9/32 in. radius; 2 1/8 in. OD, 1 1/2 in. ID, 0.006 in. thick overall; TFC part/dwg 182-55-00-17.	Spacer between rh cone clutch cam assembly MP48 and clutch retainer cap MP47.
H544		WASHER, FLAT: brass; 1/2 in. ID, 2 7/32 in. OD, 0.064 in. thick overall; TFC part/dwg 182-06-00-05.	On sync motor rear end bell. Fig. 6–14.
H601		PLIERS: for retainer rings, 18-23 size 5100 series rings; 5 5/16 in. lg, 1 1/2 in. wide overall; cadmium plated and iridate dipped; WKC Truarc pliers cat. No. 0018; TFC part/dwg 41B-00-00-31B.	In tool box on cabinet. Fig. 5–2.
H602		PLIERS: for retainer rings, 25-87 size 5100 series rings; 5 11/16 in. lg, 2 1/8 in. wide overall; cadmium plated and iridate dipped; WKC Truarc pliers cat. No. 2; TFC part/dwg 41B-00-00-32B.	In tool box on cabinet. Fig. 5–2.
H603		PLIERS: for retainer rings, 25-102 size 5000 series rings and 75-137 size 5008 series rings; 5 7/16 in. lg, 1 15/16 in. wide overall; cadmium plated and iridate dipped WKC Truarc pliers cat. No. 1; TFC part/dwg 1389B.	In tool box on cabinet. Fig. 5–2.
H604		WRENCH: Allen type; for hex nuts 0.050 in. across flats; cadmium plated and iridate dipped; TFC part/dwg 180-00-00-01.	In tool box on cabinet. Fig. 5–2.
H605		KEY: Allen type; for hex nuts 3/32 in. across flats; cadmium plated and iridate dipped; TFC part/dwg 180-00-00-02.	In tool box on cabinet. Fig. 5–2.
H606		KEY: Allen type; for hex nuts 5/64 in. across flats; cadmium plated and iridate dipped; TFC part/dwg 180-00-00-03.	In tool box on cabinet. Fig. 5–2.
H607		KEY: Allen type; for hex nuts 1/8 in. across flats; cadmium plated and iridate dipped; TFC part/dwg 180-00-00-04.	In tool box on cabinet. Fig. 5–2.
H608		KEY: Allen type; for hex nuts 5/32 in. across flats; cadmium plated and iridate dipped; TFC part/dwg 180-00-00-05.	In tool box on cabinet. Fig. 5–2.
H609		SCREWDRIVER: 3 in. lg blade, 3/32 in. wide tip; zinc plated, chromate finish; VPC part No. Allb-3″; TFC part/dwg 180-00-00-06.	In tool box on cabinet. Fig. 5–2.
H610		GASKET: sponge rubber 4 3/8 in. ID, 5 1/8 in. OD; 1/2 in. thick overall; TFC part/dwg 183-00-00-22.	Used between blower and mech unit.
H611		SCREW ASSEMBLY, 10-24: c/o 10-24x1 screw (RAY cat. No. 209-1032 P3), 10-24 retainer (RAY cat. No. 362-1037 P1), and 10-24 gasket (RAY cat. No. 287-1114 P1); TFC part/dwg 180-00-00-90.	Captive screws on top cover.
H612		SCREW ASSEMBLY, 5/16-18; c/o 5/16-18 x 1 1/4 screw (RAY cat. No. 209-1032 P12), 5/16-18 retainer (RAY cat. No. 362-1037 P3), and 5/16-18 gasket (RAY cat. No. 287-1114 P3); TFC part/dwg 180-00-00-91.	Captive screws on sloping panel
H613		SCREW, CLAMP: stainless steel; 3/4 in. dia head, 1/4 in. lg, with 1/16 in. wide x 1/16 in. deep slot and straight medium knurl with 1/32 x 45° chamfer ea edge; 11/32 in. dia shoulder, 1/4 in. lg; 10-32 thread approx 1/2 in. lg; 3/4 in. dia, 1 in. lg overall; TFC part/dwg 183-00-00-15.	Holds cutter bar ends to cabinet.
H614		SCREW, SHOULDER: stainless steel; 3/8 in. dia head, 3/32 in. lg, with 1/32 x 3/64 in. slot; 0.2 in. dia shoulder, 0.120 in. lg; 1/32 x 1/32 in. undercut between shoulder and threaded section; 6-32 NC thread, .349 in. lg; 1/32 x 45° chamfer at both edges of head and end of thread; 3/8 in. wide, 19/32 in. lg overall; TFC part/dwg 183-00-00-08.	Holds center of cutter bar to cabinet.
H615		WASHER, FLAT: C-shaped, stainless steel; center hole 0.145 in. wide radial slot, 0.371 in. lg from circumference w/0.145 in. dia semicircle at end; 0.390 in. OD, 1/32 in. nominal thickness overall; TFC part/dwg 41-00-00-15.	P/o tray assembly MP126, and also p/o shield assembly MP127.
H616		SCREW, CAPTIVE: stainless steel; 3/4 in. dia head, 3/16 in. lg, w/medium diamond knurl and 1/16 in. radius curved top edge; 0.140 in. dia unthreaded portion 7/32 in. lg; 10-32 NF2 thread, 5/32 in. lg; 3/32 in. lg 45° pointed end; 3/4 in. dia, 21/32 in. lg overall; TFC part/dwg 182-00-13-02.	P/o tray assembly MP126; also p/o shield assembly MP127.
H617		RING, RETAINER: annular shape; 0.063 in. dia stainless steel wire; center hole 0.289 in. dia; 0.063 in. nominal thickness; 1/16 in. segment removed; 0.415 in. OD; TFC Split Ring part/dwg 41-00-01-03.	P/o tray assembly MP126; also p/o shield assembly MP127.
H618		STUD: slotted head; CFC cat. No. 2600-5; TFC part/dwg 183-00-00-27.	Fastens side front doors to cabinet.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
H619		STUD: knurled head; CFC cat. No. 2655-5; TFC part/dwg 183-00-00-28.	Fastens center front door to cabinet.
J1		JACK, TIP: orange; low voltage; type MS16108-6 per MIL-STD-242A; TFC part/dwg 181-00-00-06.	Test point No. 1; V5, V6 screens.
J2		JACK, TIP: blue; low voltage; type MS16108-7 per MIL-STD-242A; TFC part/dwg 181-00-00-07.	Test point No. 2; V4A plate.
J3		Same as J2.	Test point No. 3; V102A plate.
J4		Same as J2.	Test point No. 4; V102B plate.
J5		JACK; TIP: block; low voltage; type MS16108-3 per MIL-STD-242A; TFC part/dwg 181-00-00-10.	Test point No. 5; B– (meter).
J6		JACK, TIP: green; low voltage; type MS16108-5 per MIL-STD-242A; TFC part/dwg 181-00-00-09.	Test point No. 6; V1 bias.
J7		JACK, TIP: red; low voltage; type MS16109-2 per MIL-STD-242A; TFC part/dwg 181-00-00-05.	Test point No. 7; Hi B+.
J8		Same as J7.	Test point No. 8; RB+.
J101		CONNECTOR, RECEPTACLE, ELECTRICAL: 5 round female contacts; 7½ amps, 600 v rms; four ⅛ in. dia mtg holes on 25/32 x 25/32 in. mtg centers; 1 1/16 in. square, 53/64 in. deep overall; AMP cat. No. 165-36; TFC part/dwg 181-00-00-40.	For signal cable from input barrier strip to electrical chassis; for P101 on W101.
J102		JACK, TIP: white; low voltage; type MS16108-1 per MIL-STD-242A; TFC part/dwg 181-00-00-04.	Test point No. 14; run motor, common.
J103		Same as J102.	Test point No. 15; run motor, 60 scans.
J104		Same as J102.	Test point No. 16; run motor, 90 scans.
J105		Same as J102.	Test point No. 17; run motor, 120 scans.
J201		Same as J6.	Test point No. 9; R222, sync motor control.
J202		JACK, TIP: yellow; low voltage; type MS16108-8 per MIL-STD-242A; TFC part/dwg 181-00-00-08.	Test point No. 10; V207 cathode.
J203		Same as J202.	Test point No. 11; V206 cathode.
J204		Same as J202.	Test point No. 12; V204 cathode.
J205		Same as J202.	Test point No. 13; V202 cathode.
J601		CONNECTOR, RECEPTACLE, ELECTRICAL: 2 flat female contacts; 1⅝ in. square by 9/16 in. deep; AMP cat. No. 97-4085; TFC part/dwg 180-00-00-08.	Utility outlet on side of cabinet.
K1		RELAY, ELECTRONIC: 7 sec delay timer; single pole double throw switch contacts; 120 volts; 45 to 65 cps supply voltage; 8 solder lug terminals; four 6-32 mtg studs, ⅜ in. lg on 1.688 by 1.438 in. mtg centers; 2 5/16 in. wide, 2 1/16 in .deep; 3 1/16 in. high overall excl mtg studs; TFC part/dwg 181-00-00-02.	Time delay relay.
K101		RELAY, ARMATURE: 70 vdc pick-up voltage, 40 vdc drop-out voltage; 100 vdc coil voltage; continuous duty; four pole double throw form C contact arrangement; hermetically sealed; 14 pin-type terminals; three 6-32 mtg studs ⅜ in. lg; 1¾ in. wide, 1 7/16 in. deep, 2⅛ in. high overall excl mtg studs; TFC part/dwg 181-00-00-03.	Start/stop relay.
K102		Same as K101.	Operate relay.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
L401		CHOKE, SMOOTHING: 4 hy min inductance, 25 volts; 85 ohms max dc resistance, 270 ma current rating; 90 to 130 cps frequency range; 1450 max working volts; conforms to MIL-T27A where applicable; 2 solder lug terminals; four 8-32 mtg studs on 2⅜ x 2⅛ in. mtg centers, ⅜ in. lg; 2⅞ in. by 3 in. by 3¾ in. high excl mtg studs and terminals; TFC part/dwg 184-11-00-00.	B+ filter.
LS601		LOUDSPEAKER ASSEMBLY: permanent magnet type; 3 in. dia cone; 3.2 ohm voice coil impedance; 3 W normal input wattage, 4 W peak; with 4 Elastic Stop Nut Corp. cat. No. 22NC2-62 clinch nuts w/nylon insert staked in place for mtg, on 2.828 in. mtg centers; 3⅜ in. square by 2⅝ in. deep overall; OEC cat. No. 3AMS-PM speaker with the clinch nuts added; TFC part/dwg 181-00-00-35.	Monitoring speaker.
M301		METER, AC: rectifier type; 0 to 50 microamps; fast acting; sealed and ruggedized; ±5% accuracy; conforms to MIL-M-10304A where applicable; black scale markings on white background; similar to Simpson type 145R; supplied with 3 ea 4-40 x ¾ rh screws, No. 4 hex nuts and No. 4 split ring washers; three ⅛ in. dia mtg holes 120° apart on 1.22 in. radius; 2.695 in. dia, 2.370 in. deep overall; TFC part/dwg 181-00-00-32.	Output meter.
M601		ALIGNMENT TOOL ASSEMBLY: c/o 1 ea knurled screw, base assembly, body assembly, leaf clamp, pin and chain assembly, knurled nut, 8-32 rh screw and a 4-40 x ¼ screw, and 2 ea ⅝ and ½ in. lg springs; TFC part/dwg 180-34-00-10.	In tool box on cabinet; to align stylus holder assemblies. Fig. 5–2.
M602		GAGE ASSEMBLY, STYLUS: c/o 1 ea body and sleeve assembly, lens holder, screw handle, lens holder nut, lens and stylus bushing, and 2 lens gaskets; 1⅛ in. dia, 1⅝₂ in. lg overall; TFC part/dwg 1398.	In tool box on cabinet; to straighten stylus needles. Fig. 5–2.
MP1		BAND ASSEMBLY, COMPLETE: c/o band and holder assembly (MP2), 3 ea stylus bushings (MPS), leaf dampers, and stylus leaf assemblies, and 6 ea 2-56 x 3/16 screws and lockwashers; 18½ in. OD, 5/16 in. thick overall; TFC part/dwg 110-62-00-00.	Carries stylus across recording paper. Fig. 4–10.
MP2		BAND AND HOLDER ASS0MBLY: c/o lug and band assembly, and 3 ea stylus holders (MP6), 0/8 x ½ screws, 0/80 hex nuts and #0 split washers; TFC part/dwg 110-62-01-00. (P/o MP1)	Band assembly without stylus bushings, leaf dampers and leaf assemblies.
MP3		BUSHING, STYLUS: brass, hard chrome plated; ruby jewel mounted in ea. end; ⅜ in. lg, 0.187 in. 1/16 in. ID; TFC part/dwg 110-62-00-01.	For stylus needles; p/o MP1. Fig. 4–14.
MP4	(2)	SPRING: flat type, beryllium copper, type 25S, No. 1 B&S temper, heat treated to 38 to 42 Rockwell C; 27/32 in. lg, 0.025 in. thick, 3/16 in. wide overall; TFC part/dwg 110-62-00-02. For Reference Only.	Stylus leaf damper; p/o MP1. Fig. 4–14.
MP5		Ref. Desig. cancelled.	
MP6	(2)	STYLUS HOLDER: type FM10001 nylon; 0.420 in. lg, 0.320 in. wide, 0.208 in. deep overall; TFC part/dwg 110-62-01-01. For Reference Only.	Holds stylus needle; p/o MP1. Fig. 4–14.
MP7	(2)	SPRING: type 25S beryllium copper, No. 1 B&S temper, heat treated to 30 to 33 Rockwell C; 1¼ in. lg, ⅜ in. wide, 0.142 in. deep overall; TFC part/dwg 110-62-02-01. For Reference Only.	Stylus leaf spring; p/o MP1. Fig. 4–14.
MP8	(2)	SPRING: stainless steel wire, spring temper; 1 3/16 in. lg, 3/16 in. wide, 7/16 in. deep overall; TFC part/dwg 110-62-02-03. For Reference Only.	Stylus pressure spring; p/o MP1. Fig. 4–14.
MP9		STYLUS, RECORDING, REPRODUCING: 0.011 in. dia needle, .075 in. lg; recording life approx 120 hours; 23/32 in. lg, ⅛ in. dia overall; TFC part/dwg 110B-00-00-01.	Recording stylus needle. Fig. 4–14.
MP10		SYNC ARM AND SHAFT ASSEMBLY: c/o sync arm and tip assembly, sync arm shaft, 5/16 in. ID nylon bushing, two ⅛ x ⅜ in. dowel pins, and 4 ea 6-32 x ¼ in. screws and No. 6 split washers; 0.040 in. lg, 4 1/16 in. wide, 1¼ in. deep overall; TFC part/dwg 182-00-01-00.	Restrains lugs on stlyus band to sync speed. Fig. 6–10.
MP11		BEARING; BALL: single row, radial; double shield; light duty; 7 balls; ⅝ in. ID, 1⅜ in. OD .3438 in. thick overall; grade 50 or better per Federal spec FF-B-171a; Barden Corp, cat. no. R10SS; TFC part/dwg 182-00-00-42.	For sync shaft. Fig. 6–7, 10, 11.
MP12		SYNC CLUTCH HUB ASSEMBLY: c/o 1 ea sync clutch hub, 105-tooth 48-pitch 1⅝ ID gear, and sync clutch ratchet, two ⅛ x ½ roll pins and 3 ea 6-32 x ½ screws, 4-40 x 3/16 screws, No. 6 and No. 4 split washers; 3⅛ in. dia, 2½ in. lg overall; TFC part/dwg 182-26-01-00.	P/o sync clutch. Fig. 6–11.

TABLE 7—1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
MP13	(2)	DOG LATCH HUB ASSEMBLY; c/o 1-ea dog latch hub, spring anchor and 1/8 x 3/8 dowel pin; 1 13/16 in. lg, 1 3/32 in. wide, 7/16 in. deep overall; TFC part/dwg 182-00-02-10. For Reference Only.	P/o sync clutch. Fig. 4—11, 6—10.
MP14		DOG LATCH: stainless steel, hardened to Rockwell C 60 min., black oxide finish; 11/16 in. lg, 25/32 wide, 0.187 in. thick overall; TFC part/dwg 182-00-00-40.	Engages sync arm shaft to sync drive. Fig. 6—10.
MP15		SPRING: helical extension type; stainless steel approx 0.012 in. dia; 20 right hand close wound turns, two parallel hook ends; 1/8 in. dia, 1/2 in. lg overall; 4 oz. ±1 oz. required to extend spring to 5/8 in.; TFC part/dwg 42-00-00-20.	Used between dog latch and dog latch hub. Fig. 6—10.
MP16		SYNC RATCHET PAWL ASSEMBLY: c/o tip brazed to sync ratchet pawl; 15/16 in. lg, 7/8 in. wide, 7/16 in. deep overall; TFC part/dwg 182-26-02-10.	P/o sync clutch. Fig. 6—11.
MP17		SPRING: leaf spring, 0.010 in thick beryllium copper; 15/16 in. lg, 3/16 in. wide. 0.82 in. deep overall; TFC part/dwg 182-00-00-43.	For sync and flywheel ratchets.
MP18		BEARING, BALL: single row, radial; double shield; 8 balls; light duty; 1/4 in. ID, 5/8 in. OD, 0.197 in thick overall; grade 00 per Federal spec FF-B-171A; NDP cat. no. 77-R-4; TFC part/dwg 182-16-00-07.	For paper feed worm shaft. Fig. 6—12.
MP19		BEARING, BALL: single row, radial; double shield; 7 balls; light duty; 3/8 in. ID, 7/8 in. OD, 0.281 in. thick overall; grade 00 per Federal spec FF-B-171A; NDP cat. No. 77-R-6; TFC part/dwg 182-16-00-08.	For sync gear and run gear shafts. Fig. 6—7, 6—9, 6—12.
MP20		GEAR ASSEMBLY, 108- AND 30-TOOTH: c/o 108-tooth gear pinned to shaft with 6/0 x 1/2 in. taper pin and 30-tooth gear pinned to same shaft with 7/0 x 1/2 taper pin; 2.292 in. dia, 3 5/8 in. lg overall; TFC part/dwg 182-00-00-53.	P/o sync gears. Fig. 6—12
MP21		GEAR AND BEARING ASSEMBLY: c/o 116-tooth gear and 3/8 ID compo bearing; 2.562 in. OD, 0.99 in. thick overall; TFC part/dwg 182-16-02-20.	P/o sync gears. Fig. 6—12.
MP22		RATCHET, HUB AND GEAR ASSEMBLY: c/o 54-tooth gear pinned to shaft with 1/16 x 5/8 in. roll pin, 100-tooth ratchet (MP42), hub, 1/8 x 3/8 coupling pin, 1/8 x 1/4 roll pin pinning hub to shaft, and 3 ea 4-40 x 1/4 in. screws mtg ratchet to hub; 1.563 in. dia, 3 1/16 in. lg overall; TFC part/dwg 182-16-02-05.	Flywheel ratchet, hub and gear. Fig. 6—12.
MP23		Ref. Desig. Cancelled.	
MP24		Ref. Desig. Cancelled.	
MP25		PAWL ASSEMBLY: c/o flywheel pawl tip brazed to flywheel pawl; 3/4 in. lg, 11/32 in. wide, 3/16 in. thick overall; TFC part/dwg 182-23-02-00.	P/o flywheel assembly. Fig. 6—12.
MP26	(2)	MAGNET: Alnico No. 6 U-shaped; 0.735 in. lg, 0.625 in. wide, 0.312 in. deep overall; lusterless black finish per Federal spec TT-E-527; TFC part/dwg 11-05-03-03B. For Reference Only.	Flywheel magnet. Fig. 6—12.
MP27	(2)	STOP: aluminum; lusterless black finish per Federal spec TT-E-527; 1 5/16 in. lg, 3/8 in. wide, 1/4 in. deep overall; TFC part/dwg 182-16-03-02. For Reference Only.	For flywheel magnet.
MP28		SYNC WHEEL AND SHAFT ASSEMBLY: c/o sync wheel, sync wheel shaft, two 6-32 x 1/8 screws and 24 in. stainless steel wire; approx. 6 in. dia, 4 13/16 in. lg overall; TFC part/dwg 182-00-03-00.	Idler wheel and shaft. Fig. 4—11, 6—10.
MP29		BEARING: sleeve type; nylon lined; with 1/2 in. OD flange, 0.030 in. thick; 202 lbs. radial load capacity @ 100 rpm; 5/16 in. ID, 5/16 in. lg excl flange, 1/2 in. lg overall; TII cat. No. 5L5-F; TFC part/dwg 112-00-13-13.	For sync wheel.
MP30		BEARING CAP: aluminum; lusterless black per Federal spec TT-E-527; 1 1/4 in. cut out for bearing; 2 1/4 in. dia, 5/16 in. thick overall, TFC part/dwg 182-00-00-07.	For 5/8 in. ID bearing (MP11). Fig. 6—6.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
MP31		STOP ARM; stainless steel; 7/8 in. lg, 0.310 in. wide, 0.312 in. deep overall; TFC part/dwg 010/209.	P/o sync clutch. Fig. 6–11.
MP32		GEAR ASSEMBLY: c/o 1 ea 28-tooth and 108-helical tooth gear pinned to a shaft with 1/16 x 1/2 and 1/16 x 5/8 in. roll pins respectively; 2.342 in. dia, 1 7/8 in. lg overall; TFC part/dwg 182-00-00-46.	P/o run gears. Fig. 6–9.
MP33		GEAR ASSEMBLY: c/o 1 ea 28-tooth and 90-tooth gears pinned to a shaft with 1/16 x 1/2 and 1/16 x 5/8 in. roll pins respectively; 1.917 in. dia, 1 7/8 in. lg overall; TFC part/dwg 182-00-00-47.	P/o run gears. Fig. 6–9.
MP34		GEAR: stainless steel; 32 teeth, 48 diametral pitch, 14 1/2° pressure angle, 0.6815 in. pitch diameter, 0.0478 in. depth of cut, 12° helix angle, left hand; face width 1/4 in.; hub 1/2 in. dia, 1/4 in. lg; 0.1565 in. ID, 0.723 in. OD, 1/2 in. lg overall; TFC part/dwg 182-17-01-06.	On run motor shaft. Fig. 6–9.
MP35		RUN WHEEL, SHAFT AND GEAR ASSEMBLY: c/o run wheel, run wheel shaft, 20 in. of stainless steel wire, two 6-32 x 1/8 screws, a 27-tooth gear, and 1/16 x 1/2 in. roll pin; approx 4 5/8 in. dia, 6 5/8 in. lg overall; TFC part/dwg 182-00-00-48.	Drive wheel, shaft and gear. Fig. 4–11, 6–9.
MP36		SPRING, THRUST: spring steel; NDP cat. No. S-12, degreased phosphate coated and painted lusterless black per Federal spec TT-E-527; 0.658 in. ID, 1.24 in. OD, 5/32 in. thick overall; TFC part/dwg 120B-61-00-02B.	P/o left hand cone clutch, also p/o run clutch. Fig. 6–8, 6–9, 6–21.
MP36.1		SPRING, THRUST: spring steel; NDP cat. No. S-12; 0.658 in. ID, 1.24 in. OD, 5/32 in. thick overall; TFC part/dwg 120B-61-00-02. (Same as 120B-61-00-02B, MP36, except MP36.1 is not painted.)	Right hand cone clutch spring. Fig. 6–20.
MP37		HUB: stainless steel; 1/4 in. ID, 1 1/4 in. OD, 1 1/8 in. lg overall; TFC part/dwg 182-27-00-01.	Run clutch hub. Fig. 6–8, 6–9.
MP38		PRESSURE PLATE ASSEMBLY: c/o pressure plate and 1/8 x 3/8 in. dowel pin; 1 5/16 in. dia, 3/8 in. thick overall; TFC part/dwg 182-27-01-00.	Provides bearing surface for clutch gear ass'y (MP39). Fig. 6–8, 6–9.
MP39		GEAR ASSEMBLY: c/o 105-tooth gear, oilite bushing and 2 cork plates; 2.239 in. OD, 7/16 in. ID, 3/8 in. thick overall; TFC part/dwg 182-27-02-00.	Run clutch gear. Fig. 6–8, 6–9.
MP40		BEARING, BALL: single row, radial, double shield; 0.3150 in. ID, 0.8661 in. OD, 0.2756 in. thick overall; grade 00 per Federal spec FF-B-171a; MRC cat. No. 38FF; TFC part/dwg 182-55-00-16.	For worm gear (MP57).
MP41		RATCHET PAWL ASSEMBLY: c/o ratchet pawl with ratchet pawl tip brazed in place; 23/32 in. lg, 1/2 in. wide, 11/64 in. thick overall; TFC part/dwg 42-26-03-00.	For paper feed gear ratchet. Fig. 6–17.
MP42		RATCHET: SAE 1095 steel hardened to 58 Rockwell C; 100 teeth, 0.022 in. tooth depth, 60° angle; 1.563 in. OD, 0.593 in. ID, 1/8 in. thick overall; TFC part/dwg 182-16-02-11.	Flywheel ratchet and paper feed clutch ratchet. Fig. 6–12, 6–17.
MP43		CLUTCH STOP: stainless steel; 1 5/8 in. OD, 0.312 in. thick overall; TFC part/dwg 182-55-00-03.	P/o right hand cone clutch. Fig. 6–20.
MP44		BALL: stainless steel; 0.2187 in. dia; PAC: TFC part/dwg 182-55-00-04.	P/o right hand cone clutch. Fig. 6–20.
MP45		BEARING ASSEMBLY: c/o two 3/8 in. ID bearings and a cone clutch bearing sleeve; 1.859 in. lg, 1.302 in. OD overall; TFC part/dwg 182-55-02-00.	P/o right hand cone clutch. Fig. 6–20.
MP46		GEAR ASSEMBLY: c/o 98-tooth gear pinned to worm shaft with 1/16 x 5/8 in. roll pin; worm data; single thread, 0.0656 in. lead, left hand, 3°35' helix angle, 48 normal diametral pitch, 0.333 in. pitch diameter, 0.375 in. OD, 0.0478 in. depth of cut, 15.24 threads/in.; 2.083 in dia, 4 35/64 in. lg overall; TFC part/dwg 182-00-00-49.	P/o paper feed gears. Fig. 6–17.
MP47		RETAINER CAP: stainless steel rod; 2 1/8 in. dia, 53/64 in. thick overall; TFC part/dwg 182-55-00-06.	P/o right hand cone clutch. Fig. 6–20.
MP48		CAM ASSEMBLY: c/o cone clutch cam, cone clutch cam arm, and bearing; 2 11/16 in. lg, 1 5/16 in. wide, 9/16 in. deep overall; TFC part/dwg 182-55-06-00.	P/o right hand cone clutch. Fig. 6–20.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
MP49		SPRING: helical extension type; 0.015 in. dia stainless steel wire; close wound turns, left hand; two perpendicular hook ends; 5/8 in. lg, 5/32 in. dia overall; TFC part/dwg 182-55-00-10.	For rear pressure roller assemblies. Fig. 6–22.
MP50 thru MP53		Ref. Desig. Cancelled.	
MP54		SPRING: leaf type; 1/32 in. hardened beryllium copper; 1 15/32 in. lg, 7/16 in. wide, approx 3/32 in. deep overall; TFC part/dwg 182-55-04-05.	P/o rear pressure roller assemblies.
MP55		CONE SHAFT ASSEMBLY: c/o 1 ea paper support roller, right hand cone hub, right hand cone shaft, 1/16 x 3/8 in. roll pin, and 4 rivets; 1 1/8 in. dia, 3 15/16 in. lg overall; TFC part/dwg 182-55-01-00.	Right hand paper support cone and shaft. Fig. 6–20.
MP56		SHAFT: stainless steel; 0.3748 in. dia, 2.010 in. lg overall; TFC part/dwg 182-55-00-13.	For worm gear (MP57). Fig. 6–17.
MP57		GEAR ASSEMBLY: c/o 100-tooth helical gear and 2 ea 00 x 1/4 drive screws and pivot pins; 2 1/8 in. OD, 3/8 in. ID, 0.550 in. thick overall; TFC part/dwg 182-55-08-00.	Worm gear in paper feed gear system. Fig. 6–17.
MP58		SHEAR PIN ASSEMBLY: c/o shear pin and shear pin screw; 11/16 in. lg, 1/4 in. dia overall; TFC part/dwg 182-55-07-00.	Holds worm gear (MP57) to shaft (MP56). Fig. 6–17.
MP59		GEAR ASSEMBLY: c/o 72-tooth gear, 100-tooth ratchet (MP42), bushing, and three 4-40x1/2 screws; 1.563 in. OD, 3/8 in. ID, 0.578 in. lg overall; TFC part/dwg 182-55-09-00.	P/o paper feed gears. Fig. 6–17.
MP60		PLATE ASSEMBLY: c/o clutch adjustment plate and 1/8 x 3/8 in dowel pin; 1 3/16 in. OD, 0.626 in. ID, 7/16 in. thick overall; TFC part/dwg 182-56-05-00.	For paper feed clutch. Fig. 6–21.
MP61		Ref. Desig. Cancelled.	
MP62		BEARING, THRUST: steel ball races, brass retainers; 135 lbs thrust capacity @ 50 rpm, 110 lbs @ 100 rpm, 65 lbs @ 500 rpm, & 50 lbs @ 1000 rpm; 7/16 in. ID, 1 3/16 in. OD, 5/16 in. thick overall; BGC cat. No. A013; TFC part/dwg 182-56-00-01.	For left hand paper support cone assembly. Fig. 6–21.
MP63		SPRING: helical extension type: 0.046 in. dia stainless steel wire; 10 turns, close wound, left hand; 2 straight parallel ends 9/32 in. lg; 1 3/16 in. ID, 0.2795 in. OD, 1 1/32 in. lg overall; TFC part/dwg 182-56-00-02.	End-of-paper spring. Fig. 6–21.
MP64		LEVER: 1/16 in. thick stainless steel strip; 2 3/16 in. lg, 1/2 in. wide, 7/16 in. deep overall; TFC part/dwg 182-56-00-03.	Paper feed release lever.
MP65		LEVER: 1/8 x 3/8 in. stainless steel strip; LATCH engraved on one face; 2 5/8 in. lg, 1 1/8 in. wide 3/8 in. deep overall; TFC part/dwg 182-56-00-05.	LATCH
MP66		SPRING: helical torsion type; 0.020 in. dia stainless steel wire; 8 turns, close wound, left hand; one straight end, one L-shaped end; 7/32 in. ID, 0.25875 in. OD excl ends; 1/2 in. lg, 0.383 in. wide, 5/32 in. deep overall; TFC part/dwg 182-56-00-04.	Release lever spring.
MP67		CONE SHAFT ASSEMBLY: c/o 1 ea paper support roller, paper roll stop disc (MP68), left hand hub and shaft assembly, and 4 ea No. 7 drive screws, 4-40 x 3/8 screws and No. 4 split washers; 2 3/8 in. dia, 3 5/8 in. lg overall; TFC part/dwg 182-56-02-00.	Left hand paper support cone and shaft assembly. Fig. 6–21.
MP68		STOP DISC: 0.05 in. stainless steel plate; 8 teeth, 45° apart; 7/8 in. ID, 2 3/8 in. OD, 7/32 in. thick overall; TFC part/dwg 182-56-02-01.	P/o left hand cone shaft assembly (MP67). Fig. 6–21.
MP69		HUB ASSEMBLY: c/o end-of-paper stop hub, 7/16 in. ID bearing, and a 1/8 x 13/16 in. roll pin; 1 7/16 in. lg, 1 5/16 in. wide, 11/16 in. thick overall; TFC part/dwg 182-56-03-00.	For end-of-paper stop. Fig. 6–21.
MP70 thru MP73		Ref. Desig. Cancelled.	

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
MP74		LEVER: 1/16 in. stainless steel strip; PAPER FEED engraved on front face; 2 1/2 in. lg, 29/32 in. wide, 5/16 in. deep overall, TFC part/dwg 182-00-00-19.	PAPER FEED lever.
MP75		SHAFT: stainless steel; 3/8 in. dia, 22 3/4 in. lg overall; TFC part/dwg 182-00-00-17.	Paper feed cam rod. Fig. 6–22.
MP76		Ref. Desig. Cancelled.	
MP77		SPRING, LOAD: 1/32 x 3/16 beryllium copper strip; coiled spiral; one straight end, one loop end; 3/8 in. ID, 5/16 in. OD excl ends; 1 5/16 in. lg, 1 1/4 in. wide, 3/16 in. deep overall; TFC part/dwg 182-00-00-22.	Pressure rollers load spring. Fig. 6–22.
MP78		CAM, LEFT HAND: aluminum bronze; 3/8 in. ID, 1 3/4 in. OD, 15/32 in. thick overall; TFC part/dwg 182-00-00-23.	Left hand paper feed cam. Fig. 6–22.
MP79		CAM, RIGHT HAND: same as left hand cam (MP78) except hub on opposite side of flange, aluminum bronze; 3/8 in. ID, 1 3/4 in. OD, 15/32 in. thick overall; TFC part/dwg 182-00-00-31.	Right hand paper feed cam.
MP80		CLUTCH, MINI: 4 rollers backed by separate springs (MP125); steel cam, rollers and springs; 7/16 in. max hub bore; 1.020 in. max OD, 0.640 in. wide overall; HPI cat. No. 61HU with 1/8 in. wide keyway broached through; TFC part/dwg 112-28-00-04.	P/o drum assembly, Fig. 6–18.
MP81		KEY: stainless steel, 3/8 in. ID, 1/2 in. OD, 0.709 in. lg overall; TFC part/dwg 112-28-00-09.	Hand wheel clutch key, Fig. 6–18.
MP82		GEAR: stainless steel; 72-straight teeth, 42 pitch, 14 1/2° pressure angle, 1.709 in. pitch diameter, 0.054 in. depth of cut; face width approx. 0.187 in.; three 0.120 in. dia holes c'sunk for No. 4 flat head screw equally spaced on 0.562 in. radius; 1.757 in. OD, 7/8 in. ID, 0.187 in. thick overall; TFC part/dwg 182-28-00-01.	P/o drum assembly. Fig. 6–18.
MP83 thru MP85		Ref. Desig. Cancelled.	
MP86		DRUM SUBASSEMBLY: c/o 1 ea drum, left hand and right hand drum bells; 2 in. dia; 19.843 in. lg, overall; TFC part/dwg 182-28-01-00.	Paper feed drum. Fig. 6–18.
MP87		Ref. Desig. Cancelled.	
MP88		BEARING, FLAT: porous bronze, grade 3H-X; 0.093 in. thick flange, 1 1/8 in. dia, w/0.128 in. wide slot 3/32 in. deep; 0.873 in. dia hub, 0.407 in. lg. 0.627 in. ID, 1 1/8 in. OD, 1/2 in. thick overall; TFC part/dwg 112-28-00-07.	For drum shaft, at left end of drum. Fig. 6–18.
MP89	(2)	BEARING, FLAT: bunting bronze; 0.3755 in. ID, 1.020 in. OD, 0.093 in. thick overall; TFC part/dwg 112-28-00-01. For Reference Only.	For hand wheel hub Fig. 6–18.
MP90		BEARING, FLAT: porous bronze, grade 3H-X; flange 0.093 in. thick, 1 1/8 in. dia, w/0.128 in. wide slot 3/32 in. deep; hub 0.873 in. dia, 3/8 in. lg; 0.627 in. ID, 1 1/8 in. OD, 0.468 in. lg overall; TFC part/dwg 182-48-00-03.	For right hand end of drum.
MP91		Ref. Desig. Cancelled.	
MP92		FRONT PRESSURE ROLLER ASSEMBLY; c/o rubber pressure roller and front pressure roller shaft; 5/16 in. dia, 1 11/32 in. lg overall; TFC part/dwg 182-00-05-20.	Front pressure roller and shaft assembly. Fig. 6–19.
MP93		GEAR ASSEMBLY: c/o 27-tooth gear and 1/4 x 7/16 x 1/4 oilite bearing; 0.686 in. OD, 1/4 in. ID, 1 1/4 in. thick overall; TFC part/dwg 182-00-05-10.	P/o front pressure roller assembly Fig. 6–19.
MP94		Ref. Desig. Cancelled.	
MP95		SPRING: helical torsion type; 0.030 in. dia stainless steel wire; 6 1/2 turns, close wound, right hand; 11/32 in. OD, 0.53 in. lg overall; TFC part/dwg 182-00-00-33.	Right hand front pressure roller spring. Fig. 6–19.
MP96		SPRING: helical torsion type; 0.030 in. dia stainless steel wire; 6 1/2 turns, close wound, left hand; 11/32 in. OD, 0.53 in. lg overall; TFC part/dwg 182-00-00-34.	Left hand front pressure roller spring.

TABLE 7—1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
MP97		GEAR ASSEMBLY: c/o 33-tooth gear and 1/4 x 7/16 x 11/32 oilite bearing; 1/4 in. ID, 0.828 in. OD, 0.343 in. deep overall; TFC part/dwg 182-00-17-00.	For front pressure rollers. Fig. 6—19.
MP98		PAPER GUIDE SPRING ASSEMBLY: c/o left and right hand guide springs, and front and rear spring supports, and four 6-32 x 1/4 screws; 18 1/2 in. lg, 1 3/8 in. high, 1/2 in. thick overall; TFC part/dwg 182-00-07-00.	Paper guide fingers. Fig. 4—10.
MP99		DEFLECTOR PLATE: brass, hard chrome plated, one side buffed; 1 1/4 in. by 2 31/64 in. by approx 0.040 in. thick overall; TFC part/dwg 112-54-00-03.	Deflects stylus needles over edge of paper. Fig. 4—10.
MP100		SPRING: helical compression type; music wire; right or left hand, open wound; plain ends; 15 turns/in.; 7/64 in. compressed length; 7/32 in. OD, 13/64 in. lg overall; TFC part/dwg 112-54-00-04.	Small deflector plate spring.
MP101		SPRING: helical compression type; music wire; right or left hand, open wound; plain ends; 16 turns/in.; 3/16 in. max compressed length; 7/32 in. OD, 17/32 in. lg overall; TFC part/dwg 112-54-00-06.	Long deflector plate spring.
MP102		Ref. Desig. Cancelled.	
MP103		BRUSH: 5/16 in. lg bristles with 3/16 in. lg flange; 1 in. wide, 3/16 in. thick, 3/4 in. lg overall; FBC part No. 8M-1453-3-L; TFC part/dwg 112-00-01-01B.	Cleans stylus needles and under side of band. Fig. 6—5.
MP104		MOTOR SHAFT AND GEAR ASSEMBLY: c/o 116-tooth left hand helical gear, complete sync motor shaft assembly, and a 4/0 x 5/8 taper pin; 2.562 in OD, 5 5/32 in. lg overall; TFC part/dwg 182-00-00-50.	P/o sync motor B501. Fig. 6—14.
MP105		BEARING, BALL: single row, radial load; double metal shield; light duty; steel balls, races and retainers; 3/8 in. ID, 7/8 in. OD, 0.2812 in. thick overall; grade 50 or better per Federal spec FF-B-171a; BAR cat. No. R6SS; TFC part/dwg 182-06-00-02.	For sync motor shaft. Fig. 6—14.
MP106	(2)	SPRING: helical compression type; beryllium copper wire; 4 turns close wound, remainder 16 turns per in., right hand; closed loop one end; 11/16 in. lg, 0.224 in. OD overall; TFC part/dwg 182-06-02-01. For Reference Only.	Sync motor decoupling spring; p/o B501. Fig. 6—14.
MP107		SPRING: thrust type; 0.452 in. bore, 0.846 in. OD, 1/8 in. thick overall; WB cat. No. R6; TFC part/dwg 182-06-00-03.	Sync motor thrust spring; p/o B501. Fig. 6—14.
MP108		CLAMP, HOSE: for 3 1/2 in. dia hose; screw type closure; BRC cat. No. QS-10 O-M52S; TFC part/dwg 110C-50-00-08.	For exhaust hoses MP109 and MP110.
MP109		HOSE, FLEXIBLE: c/o coated fabric and supporting steel spiral; neoprene coated cotton fabric; electro-galvanized cold rolled steel, rated for 24-hr salt spray; 3 1/2 in. dia, 10 1/2 in. lg overall; WRM Flexible Air Duct 86-1A, 3 1/2 in. dia; TFC part/dwg 180-00-00-10.	Exhaust hose from blower unit to rear of cabinet.
MP110		HOSE, FLEXIBLE: c/o coated fabric and supporting steel spiral; neoprene coated cotton fabric; electro-galvanized cold rolled steel, rated for 24 hour salt spray; 3 1/2 in. dia, 10 ft lg overall; WRM Flexible Air Duct 86-1A, 3 1/2 in. dia; TFC part/dwg 180-00-00-41. Same as MP109 except 10 ft long.	Exhaust hose from rear of cabinet.
MP111		Ref. Desig. Cancelled.	
MP112		SPRING: helical extension type; 0.008 in. dia stainless steel wire, spring temper, bright finish; approx 20 turns, close wound, left hand; one eye term c/o 1 1/2 to 2 loops bent over in line with one end of spring; 1/2 in. lg straight axial term at other end, 180° from eye term; 3/16 in. lg excl term; 0.105 in. dia, 0.7925 in. lg overall; TFC part/dwg 90-06-04-04.	Phase actuator return spring; p/o E501. Fig. 6—13.
MP113		SPRING: 0.020 in. dia stainless steel wire; 0.046 in. at one end bent 90°, 3/16 at other end bent 90° in opposite direction; 5/8 in. lg, 0.2135 in. wide, 0.020 in. thick overall; TFC part/dwg 42-26-00-02.	Paper feed ratchet pawl springs. Fig. 6—17.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
MP114		REAR PRESSURE ROLLER AND 33-TOOTH GEAR ASSEMBLY: c/o 1 ea rear pressure roller assembly, 33-tooth gear and a 1/16 x 3/8 in. roll pin; TFC part/dwg 182-00-00-54.	P/o rear pressure roller assembly. Fig. 6–22.
MP115		BLOCK ASSEMBLY, RIGHT HAND REAR PRESSURE ROLLER c/o 1 ea rear pressure roller arm, 3/16 x 5/16 x 7/16 and 3/16 x 5/16 x 3/8 compo bearings, a spring pin and a 1/8 x 3/8 roll pin; TFC part/dwg 182-00-00-55.	P/o right hand rear pressure roller assembly.
MP116		BLOCK ASSEMBLY, LEFT HAND REAR PRESSURE ROLLER: c/o 1 ea rear pressure roller arm, 3/16 x 5/16 x 7/16 and 3/16 x 5/16 x 3/8 compo bearings, a spring pin and a 1/8 x 3/8 roll pin; TFC part/dwg 182-00-00-56.	P/o left hand rear pressure roller assembly. Fig. 6–22.
MP117		BLOCK ASSEMBLY, RIGHT HAND FRONT PRESSURE ROLLER: c/o 1 ea right hand pressure roller arm, wear plate, 1/4 x 7/16 x 3/16 and 1/4 x 7/16 x 15/32 compo bearings, and a shaft, and two 00 x 1/4 drive screws; TFC part/dwg 182-00-00-57.	P/o right hand front pressure roller assembly. Fig. 6–19.
MP118		BLOCK ASSEMBLY, LEFT HAND FRONT PRESSURE ROLLER: c/o 1 ea left hand pressure roller arm, wear plate; 1/4 x 7/16 x 3/16 and 1/4 x 7/16 x 15/32 compo bearings, and a shaft, and two 00 x 1/4 drive screws; TFC part/dwg 182-00-00-58.	P/o left hand front pressure roller assembly.
MP119		TROLLEY BAR ASSEMBLY, COMPLETE: c/o 1 ea trolley bar assembly, trolley run-off curve, trolley run-on curve, and a 6-32 x 3/8 binding head screw and nut, and 3 ea .0001 mf capacitors (C505, C506, C507) and 6-32 x 1/4 binding head screws; TFC part/dwg 182-00-00-59.	Guides stylus needles across recording paper and conducts signal to them. Fig. 4–10 and 4–15.
MP120		HANDWHEEL ASSEMBLY, COMPLETE: c/o 1 ea handwheel, handwheel hub, 1/2 in. ID compo bearing and 3/8 in. ID compo bearing, and a 1/8 x 1/2 in. roll pin; TFC part/dwg 182-00-00-60.	Manual paper advance wheel. Fig. 6–18.
MP121		SPRING: conical, helical compression type; music wire; left or right hand, open wound; one squared end, one plain end; solid height 7/32 in. max; load data: 8 lbs @ 7/8 in., 10 lbs @ 1/2 in.; lusterless black; TFC part/dwg 112-55-00-02B.	Paper load spring. P/o right hand cone assembly; Fig. 6–20.
MP122		SHAFT: stainless steel; 25 3/16 in. lg, 0.6425 in. dia overall; TFC part/dwg 182-48-00-01.	Drum shaft. Fig. 6–18.
MP123		GEAR: stainless steel; gear data: 48 teeth, 14 1/2° pressure angle, 48 diametral pitch. 1.000 in. pitch dia, 1.042 in. OD, 0.0478 in. depth of cut; 13/16 in dia hub, 7/32 in. lg; 1.042 in. OD, 5/8 in. ID, 13/32 in. lg overall; TFC part/dwg 182-48-00-02.	At right end of drum.
MP124		GEAR: stainless steel; gear data: 18 teeth, 14 1/2° pressure angle, 42 diametral pitch, 0.424 in. pitch dia, 0.471 in. OD, 0.054 in. depth of cut; 0.360 in. dia hub, 1/8 in. lg; 0.471 in. OD, 1/4 in ID, 0.281 in. lg overall; TFC part/dwg 182-00-05-05	P/o front pressure roller assemblies. Fig. 6–19.
MP125		SPRING: helical compression type; steel; TFC part/dwg 182-00-00-61.	P/o mini-clutch (MP80) in paper feed wheel. Fig. 6–18.
MP126		TRAY ASSEMBLY, COMPLETE: c/o 1 ea carbon dust tray and captive screw retainer, and two ea captive screws (H616), split rings (H617) and captive screw washers (H615); TFC part/dwg 182-00-16-00.	Carbon dust tray.
MP127		SHIELD ASSEMBLY, COMPLETE: c/o front shield assembly, 2 ea sliding stops and pivot hinge bracket studs, and 3 ea captive screws (H616), split rings (H617) and captive screw washers (H615); TFC part/dwg 182-00-13-00.	Front cover of the mech unit.
MP128		DOOR ASSEMBLY, COMPLETE, SIDE: c/o 1 ea side door, hinge, plate clamp, Metex, two slotted head studs (H618), and four 8-32 x 3/8 slotted head cup point set screws; TFC part/dwg 180-00-00-92.	Side doors on cabinet front.
MP129		DOOR ASSEMBLY, COMPLETE, CENTER: c/o 1 ea center door and hinge, and two knurled studs (H619); TFC part/dwg 180-00-00-93.	Center door on cabinet front.
MP130		TOOL PLATE ASSEMBLY: c/o 1 ea tool mtg plate, stylus lens nest, stylus fixture bracket, fixture bracket spring, tool clip, spring chain clip and fuse clip, 2 ea tool clips, 10-24 Raytheon inserts, 8-32 x 1 3/4 binding head screws and 8-32 hex nuts, 3 tool brackets, 4 No. 8 ext. lockwashers, 5 Fahnstock clips and seven 6-32 x .085 clinch nuts; TFC part/dwg 183-00-22-00.	Holds accessory tools inside top cover of cabinet. Fig. 5–2.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
MP131		CUTTER BAR ASSEMBLY: c/o 1 cutter bar and 2 cutter bar locating plates; TFC part/dwg 183-00-21-00.	On sloping panel; used to cut paper.
MP132		HINGE ASSEMBLY: c/o 1 ea sliding stop, grip, stud and a strip; TFC part/dwg 183-00-15-00.	Links left side of top cover to cabinet.
MP133		HINGE ASSEMBLY, LEFT HAND: c/o 1 ea base pivot stop pin, top pivot stop pin, upper stop link spacer, middle shaft stop link, No. 2 stop link assembly, lower shaft spacer, left hand link bracket assembly (MP135), and left hand stop link bracket assembly (MP136), two No. 1 upper stop links, and six 3/16 in. retainer rings; TFC part/dwg 183-00-18-00.	Links left side of sloping panel to cabinet back.
MP134		HINGE ASSEMBLY, RIGHT HAND: c/o 1 ea base pivot stop pin, top pivot stop pin, upper stop link spacer, middle shaft stop link, No. 2 stop link assembly, lower shaft spacer, right hand link bracket assembly (MP137) and right hand stop link bracket assembly (MP138), two No. 1 upper stop links, and six 3/16 in. retainer rings; TFC part/dwg 183-00-19-00.	Links right side of sloping panel to cabinet back.
MP135		BRACKET ASSEMBLY, LEFT HAND LINK: c/o left hand link bracket and two 6-32 x .085 in. clinch nuts; TFC part/dwg 183-00-18-10.	Top part of left hand hinge assembly MP133.
MP136		BRACKET ASSEMBLY, LEFT HAND STOP LINK: c/o left hand stop link bracket and two 6-32 x .085 in. clinch nuts; TFC part/dwg 183-00-18-20.	Lower part of left hand hinge assembly MP133.
MP137		BRACKET ASSEMBLY, RIGHT HAND LINK: c/o right hand link bracket and two 6-32 x .085 in. clinch nuts; TFC part/dwg 183-00-19-10.	Top part of right hand hinge assembly MP134.
MP138		BRACKET ASSEMBLY, RIGHT HAND STOP LINK: c/o right hand stop link bracket and two 6-32 x .085 in. clinch nuts; TFC part/dwg 183-00-19-20.	Lower part of right hand hinge assembly MP134.
MP139		SPRING, THRUST: spring steel; KAN Disc Spring "K" No. EL-7; 0.740 in. OD, 0.402 in. ID, 0.276 in. thick overall; TFC part/dwg 182-55-00-18.	Thrust spring in paper feed clutch. Fig. 6–17.
P1		CONNECTOR, PLUG, ELECTRICAL: 3 male contacts, flat; type UP121M per MIL-C-3767; TFC part/dwg 180-00-10-02.	On power cable W1.
P101		CONNECTOR, PLUG, ELECTRICAL: 5 round male contacts; 7½ amp current rating, 600 v rms; 3/8 in. dia cable opening; 57/64 in. dia, 2¾ in. lg overall; AMP cat. No. 165-33; TFC part/dwg 180-00-01-02.	On cable from input terminal board to electrical chassis; p/o W101.
R1		RESISTOR, FIXED, COMPOSITION: 100 ohms ±5%, ½ W; MIL type RC20GF101J; TFC part 004/RC10105.	R301 trimmer. Fig. 6–25.
R2		RESISTOR, FIXED, COMPOSITION: 75,000 ohms ±5%, ½ W; MIL type RC20GF753J; TFC part 004/RC75302.	V1B grid resistor. Fig. 6–25.
R3	(1)	RESISTOR, FIXED, COMPOSITION: 10 ohms ±10%, ½ W; MIL type RC20GF100K; TFC part 004/RC10001.	V1A cathode resistor. Fig. 6–25.
R4	(1)	RESISTOR, FIXED, COMPOSITION: 6,800 ohms ±10%, ½ W; MIL type RC20GF682K; TFC part 004/RC68203.	V2B cathode resistor. Fig. 6–25.
R5	(1)	RESISTOR, FIXED, COMPOSITION: 100,000 ohms ±10%, ½ W; MIL type RC20GF104K; TFC part 004/RC10404.	V2A cathode resistor. Fig. 6–25.
R6	(1)	RESISTOR, FIXED, COMPOSITION: 47,000 ohms ±10%, ½ W; MIL type RC20GF473K; TFC part 004/RC47303.	R301 trimmer. Fig. 6–25.
R7	(1)	RESISTOR, FIXED, COMPOSITION: 1.5 megohms ±10%, ½ W; MIL type RC20GF155K; TFC part 004/RC15501.	V1A, V1B grid return. Fig. 6–25.
R8	(1)	RESISTOR, FIXED, COMPOSITION: 680,000 ohms ±10%, ½ W; MIL type RC20GF684K; TFC part 004/RC68401.	ALC filter resistor. Fig. 6–25.
R9		Same as R5.	V2B plate load. Fig. 6–25.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
R10		Same as R5.	V3A plate load. Fig. 6–25.
R11	(1)	RESISTOR, FIXED, COMPOSITION: 15,000 ohms ±10%, 2 W; MIL type RC42GF153K; TFC part 004/RC15303.	B– decoupling for V1 and V2. Fig. 6–25.
R12	(1)	RESISTOR, FIXED, COMPOSITION: 1,000 ohms ±10%, 2 W; MIL type RC42GF102K; TFC part 004/RC10203.	V3A B– decoupling. Fig. 6–25.
R13	(1)	RESISTOR, FIXED, COMPOSITION: 3,300 ohms ±10%, ½ W; MIL type RC20GF332K; TFC part 004/RC33203.	V3A cathode resistor. Fig. 6–25.
R14	(1)	RESISTOR, FIXED, COMPOSITION: 470,000 ohms ±10%, ½ W; MIL type RC20GF474K; TFC part 004/RC47403.	V3B grid resistor. Fig. 6–25.
R15	(1)	RESISTOR, FIXED, COMPOSITION: 33,000 ohms ±10%; ½ W; MIL type RC20GF333K; TFC part 004/RC33303.	M301 trimmer resistor. Fig. 6–25.
R16	(1)	RESISTOR, FIXED, COMPOSITION: 1.8 megohms ±10%; ½ W; MIL type RC20GF185K; TFC part 004/RC18502.	M301 trimmer resistor. Fig. 6–25.
R17	(1)	RESISTOR, FIXED, COMPOSITION: 22,000 ohms ±10%; ½ W; MIL type RC20GF223K; TFC part 004/RC22303.	V4B plate load. Fig. 6–25.
R18	(1)	RESISTOR, FIXED, COMPOSITION: 1,500 ohms ±10%, ½ W; MIL type RC20GF152K; TFC part 004/RC15204.	V4B cathode resistor. Fig. 6–25.
R19	(1)	RESISTOR, FIXED, COMPOSITION: 120,000 ohms ±10%, ½ W; MIL type RC20GF124K; TFC part 004/RC12403.	R27A trimmer. Fig. 6–25.
R20		Same as R13.	V4A cathode resistor. Fig. 6–25.
R21	(1)	RESISTOR, FIXED, COMPOSITION: 150,000 ohms ±10%, ½ W; MIL type RC20GF154K; TFC part 004/RC15403.	V5 and V6 grids voltage dropping. Fig. 6–25.
R22		Same as R6.	T3 impedance matching. Fig. 6–25.
R23, R24		Deleted.	
R25		Same as R6.	V6 current limiting. Fig. 6–25.
R26		Same as R6.	V4A current limiting. Fig. 6–25.
R27		RESISTOR, VARIABLE, COMPOSITION: 2 sect, 250,000 & 50,000 ohms ±10%, 2 W; single round metal slotted shaft ¼ in. dia, ⅞ in. lg; std A taper; ABC type JJ; TFC part/dwg 004/RV50305.	CONTRAST control. A-V4A grid; B-bias supply. Fig. 5–3, 6–25.
R28	(1)	RESISTOR, FIXED, COMPOSITION: 47 ohms ±10%; ½ W; MIL type RC20GF470K; TFC part 004/RC47002.	V5 cathode resistor. Fig. 6–25.
R29		Same as R28.	V6 cathode resistor. Fig. 6–25.
R30		RESISTOR, VARIABLE, COMPOSITION: 100,000 ohms ±10%; ⅓ W; MIL type RV6LAYSD104A; TFC part 004/RV10403.	ALC OUTPUT control. Fig. 5–3, 6–25.
R101	(1)	RESISTOR, FIXED, COMPOSITION: 47,000 ohms ±10%, 1 W; MIL type RC32GF473K; TFC part 004/RC47304.	V104, V106 coupling. Fig. 6–26.
R102		Same as R14.	V102A grid resistor. Fig. 6–26.
R103	(1)	RESISTOR, FIXED, COMPOSITION: 1 megohm ±10%; ½ W; MIL type RC20GF105K; TFC part 004/RC10502.	V102A grid resistor. Fig. 6–26.
R104		Same as R5.	S104 load resistor. Fig. 6–26.
R105		Same as R6.	V107 to R137 voltage dropping. Fig. 6–26.
R106		Same as R18.	V103 cathode resistor. Fig. 6–26.
R107		RESISTOR, FIXED, COMPOSITION: 2 megohms ±5%, ½ W; MIL type RC20GF205J; TFC part 004/RC20502.	B+ limiting, V102A grid. Fig. 6–26.
R108		Same as R14.	V102A current limiting. Fig. 6–26.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
R109	(1)	RESISTOR, FIXED, COMPOSITION: 270,000 ohms ±10%; ½ W; MIL type RC20GF274K; TFC part 004/RC27402.	V102A isolation. Fig. 6–26.
R110		Same as R17.	V102B voltage divider. Fig. 6–26.
R111	(1)	RESISTOR, FIXED, COMPOSITION: 2,700 ohms ±10%; ½ W; MIL type RC20GF272K; TFC part 004/RC27202.	Bias supply bleeder. Fig. 6–26.
R112		Same as R6.	Bias supply voltage dropping. Fig. 6–26.
R113		Same as R21.	Bias supply voltage dropping. Fig. 6–26.
R114		Same as R103.	V102B voltage limiting. Fig. 6–26.
R115	(1)	RESISTOR, FIXED, COMPOSITION: 39,000 ohms ±10%, ½ W; MIL type RC20GF393K; TFC part 004/RC39304.	V101B plate load Fig. 6–26.
R116	(1)	RESISTOR, FIXED, COMPOSITION: 56,000 ohms ±10%, ½ W; MIL type RC20GF563K; TFC part 004/RC56303.	V101A plate load. Fig. 6–26.
R117		Same as R14.	CR102 shunt. Fig. 6–26.
R118		Same as R14.	CR103 shunt. Fig. 6–26.
R119		Same as R103.	V102B grid. Fig. 6–26.
R120		Same as R103.	V102B B+ voltage divider. Fig. 6–26.
R121		Same as R115.	V102B voltage divider. Fig. 6–26.
R122	(1)	RESISTOR, FIXED, COMPOSITION: 1,000 ohms ±10%; ½ W; MIL type RC20GF102K; TFC part 004/RC10206.	V101A cathode resistor. Fig. 6–26.
R123		Same as R18.	V101B cathode resistor. Fig. 6–26.
R124		Same as R5.	FL103 impedance matching. Fig. 6–26.
R125		Same as R14.	FL102 isolation. Fig. 6–26.
R126		RESISTOR, VARIABLE, COMPOSITION: 500,000 ohms ±10%; 2 W; std A taper; single round metal slotted shaft, ¼ in. dia, ⅞ in. lg; MIL type RV4NAVSD504A; TFC part/dwg 004/RV50403.	RB+ control. Fig. 6–26.
R127		Same as R5.	R126 trimmer. Fig. 6–26.
R128		Same as R109.	R126 trimmer. Fig. 6–26.
R129		Same as R109.	V102B voltage divider. Fig. 6–26.
R130		RESISTOR, VARIABLE, WIRE-WOUND, POWER TYPE: 1,000 ohms ±10%, 25 W; std A taper; single round metal slotted shaft, ¼ in. dia, ⅞ in. lg; MIL type RP101SD102KK; TFC part/dwg 004/RA10202.	RUN MOTOR ADJUST – 60 scans. Fig. 5–3, 6–26.
R131		Same as R130.	RUN MOTOR ADJUST – 90 scans. Fig. 5–3, 6–26.
R132		Same as R130.	RUN MOTOR ADJUST – 120 scans. Fig. 5–3, 6–26.
R133		Same as R6.	V105 grid. Fig. 6–26.
R134		Same as R6.	V105, V106 grid. Fig. 6–26.
R135		Same as R6.	V106A, V106B coupling. Fig. 6–26.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
R136		Not used.	
R137		Same as R13.	Bias supply bleeder. Fig. 6–26.
R201	(1)	RESISTOR, FIXED, COMPOSITION: 2,200 ohms ±10%, ½ W; MIL type RC20GF222K; TFC part 004/RC22203.	V202B cathode resistor. Fig. 6–28.
R202		Same as R14.	V201 screen. Fig. 6–28.
R203	(1)	RESISTOR, FIXED, COMPOSITION: 10,000 ohms ±10%; ½ W; MIL type RC20GF103K; TFC part 004/RC10307.	V201, V202A B+ decoupling. Fig. 6–28.
R204		Same as R5.	V201 plate load. Fig. 6–28
R205		Same as R5.	V202B plate load. Fig. 6–28.
R206		Same as R122.	V201 cathode. Fig. 6–28.
R207		Same as R201.	V205B cathods. Fig. 6–28.
R208		Same as R122.	V202B cathode. Fig. 6–28.
R209		Same as R14.	V202A grid. Fig. 6–28.
R210		Same as R17.	V203A plate load. Fig. 6–28.
R211	(1)	RESISTOR, FIXED, COMPOSITION: 68,000 ohms ±10%, ½ W; MIL type RC20GF683K; TFC part 004/RC68305.	Trimmer for 120 scans mitor drive. Fig. 6–28.
R212		Same as R201.	V203 cathode. Fig. 6–28.
R213	(1)	RESISTOR, FIXED, COMPOSITION: 12,000 ohms ±10%, ½ W; MIL type RC20GF123K; TFC part 004/RC12302.	V203A grid. Fig. 6–28.
R214	(1)	RESISTOR, FIXED, COMPOSITION: 220,000 ohms ±5%; ½ W; MIL type RC20GF224J; TFC part 004/RC22403.	V203A grid voltage divider. Fig. 6–28.
R215		Same as R5.	V202A plate load. Fig. 6–28.
R216		Same as R15.	Trimmer for 60 scans motor drive. Fig. 6–28.
R217		Same as R211.	90 scans sync motor trimmer. Fig. 6–28.
R218		Same as R14.	V206, V207 screen load. Fig. 6–28.
R219	(1)	RESISTOR, FIXED, ~~COMPOSITION~~: ~~56,000~~ ohms ±~~10~~%, ~~2~~ W; MIL type ~~RC42GF563K;~~ TFC part 004/~~RC56304.~~	E501 voltage dropping. Fig. 6–28.
R220		Same as R219.	E501 voltage dropping. Fig. 6–28.
R221	(~~1~~)	RESISTOR, VARIABLE, COMPOSITION: 50,000 ohms ±10%, 2 W; std A taper; single round metal slotted shaft, ¼ in. dia, ⅞ in. lg; MIL type RV4NAVSD503A; TFC part/dwg 004/RV50306.	FORK DRIVE control. Fig. 5–3, 6–28.
R222		Same as R221.	SYNC MOTOR DRIVE control. Fig. 5–3, 6–28.
R223	(1)	RESISTOR, FIXED, COMPOSITION: 220 ohms ±10%, 2 W; MIL type RC42GF221K; TFC part 004/RC22101.	V207 cathode. Fig. 6–28.
R224		Same as R223.	V206 cathode. Fig. 6–28.
R225		Same as R203.	R221 trimmer. Fig. 6–28.
R226		Same as R14.	C219A shunt. Fig. 6–28.
R227	(1)	RESISTOR, FIXED, COMPOSITION: 10,000 ohms ±10%, 1 W; MIL type RC32GF103K; TFC part 004/RC10308.	V204 plate load. Fig. 6–28.
R228		Same as R103.	V204 grid. Fig. 6–28.
R229		Same as R103.	V204 cathode voltage divider. Fig. 6–28.
R230		Same as R103.	V205 bias. Fig. 6–28.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
R231	(1)	RESISTOR, FIXED, COMPOSITION: 150,000 ohms ±10%, 2 W; MIL type RC42GF154K; TFC part 004/RC15404.	V5, V6 screen resistor. Fig. 6–28.
R232		Same as R8.	DS202 load. Fig. 6–28.
R233		Same as R219.	V204 cathode. Fig. 6–28.
R234		Same as R21.	V205A grid. Fig. 6–28.
R235		Same as R8.	V205A plate load. Fig. 6–28.
R236		Same as R126.	PHASE ADJUST control. Fig. 5–3, 6–28.
R301		RESISTOR, VARIABLE, COMPOSITION: 10,000 ohms ±10%; 2 W; std A taper; single round metal slotted shaft, ¼ in. dia, ⅞ in. lg; includes single pole, double throw switch (S306) rated @ 2 amp, 125 v; OFF in max counterclockwise position; 3 solder lug terminals; CLA type 53MS; TFC part/dwg 004/RV10301.	GAIN control. Fig. 3–1.
R302		Same as R126.	SPKR VOLUME control. Fig. 3–1.
R303		Same as R221.	V5, V6 screen grids; DENSITY control. Fig. 3–1.
R401		RESISTOR, FIXED, WIRE WOUND (POWER TYPE); 20 ohms ±5%, 7 W; MIL type RW55V200; TFC part 004/RW20001.	Current limiting for power rectifiers. Fig. 5–10.
R402		RESISTOR, FIXED, WIRE WOUND (POWER TYPE): 10 ohms ±5%, 7 W; MIL type RW55V100; TFC part 004/RW10001.	Bias rectifier current limiter. Fig. 5–10.
R403		Same as R401.	Current limiting for power rectifiers. Fig. 5–10.
R404		RESISTOR, FIXED, WIRE WOUND (POWER TYPE): 5,000 ohms ±5%, 7 W; MIL type RW55G502; TFC part 004/RW50202.	V103 current limiting. Fig. 5–10.
R405		Same as R231.	B+ bleeder resistor. Fig. 5–10.
R406		Same as R231.	Bias supply bleeder. Fig. 5–10.
R501		RESISTOR, FIXED, WIRE WOUND (POWER TYPE): 1,200 ohms 14 W; MIL type RW31V122; TFC part 004/RW12204.	Current limiting for stylus needles. Fig. 6–30.
S101		SWITCH, PUSH BUTTON: type MS25089-3F per MIL-S-6743; 10 amp resistive current capacity; approx 0.085 in. total plunger travel; black button; ⅞ in. dia, 1⅜ in. lg overall; HET cat. No. W103WB6; TFC part/dwg 181-00-00-29.	STOP test switch. Fig. 6–26.
S102		Same as S101.	RECORD test switch. Fig. 6–26.
S103		Same as S101.	START test switch. Fig. 6–26.
S104		Same as S101.	STEADY test switch. Fig. 6–26.
S301		SWITCH, ROTARY: 2 sections, 5 positions ea section; 1 section w/shorting type contacts, 1 section w/non-shorting type; incl 1 double pole single throw switch, off in max counterclockwise position of shaft; silver plated brass contacts, ceramic wafers; 30° angle of throw; supplied w/two ⅜-32 hex nuts and one ⅜ internal lockwasher; 5⅝ in. lg, 1⅝ in. dia overall; switch conforms to MIL-S-3786 as amended; OMC type 12920-1; TFC part/dwg 181-00-00-30.	OFF, STAND BY, START, SYNC, RUN selector switch. Fig. 3–1.
S302		SWITCH, ROTARY: 2 sections, 3 positions ea section; 1 section w/shorting type contacts, 1 section w/non-shorting type; silver plated brass contacts and rotors, ceramic wafers; 30° angle of throw; supplied w/two ⅜-32 hex nuts and one ⅜-internal lock washer; 1⅝ in. dia, 2 in. lg overall; OMC type F; TFC part/dwg 181-00-00-31.	60, 90, 120 SCANS/MIN selector switch. Fig. 3–1.
S303		SWITCH, TOGGLE: double pole, double throw; one position momentary; type MS35059-17 per MIL-STD-242A; TFC part/dwg 181-00-00-22.	PHASE switch. Fig. 3–1.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
S304		SWITCH, TOGGLE: double pole, double throw; both positions momentary; type MS35059-18 per MIL-STD-242A; TFC part/dwg 181-00-00-21.	START RECORD switch. Fig. 3–1.
S305		SWITCH, TOGGLE: double pole, double throw, neither position momentary; type MS35059-15 per MIL-STD-242A; TFC part/dwg 181-00-00-20.	AUTO/MAN switch. Fig. 3–1.
S306		P/o R301.	ALC lock-out switch.
S401		Same as R305.	LINE VOLTAGE, LOW HIGH switch. Fig. 4–9, 5–9.
S501		SWITCH, SENSITIVE: single pole, double throw contact arrangement; 10 amp resistive load; 14 oz max operating force; 0.020 in. max movement differential; 0.046 in. max pretravel; 0.031 in. min overtravel; NC, NO & common terminals; type AN3234-1 per MIL-S-6743; TFC part/dwg 182-00-00-35.	End-of-paper switch. Fig. 6–30.
T1		TRANSFORMER, AF: plate coupling type; interstage transformer type TF4RX12AJ per MIL-T-27A; 100 to 10,000 cps ±2 db frequency response; 5,000 ohms, 0.010 amps dc primary; two secondaries, 600 ohms ea; 6 Lundey Associates type 199TH terminals; four 6-32 mtg studs, 3/8 in. lg on 1 3/16 in. square mtg centers; 1 5/8 in. square, 2 3/8 in. high overall excl mtg studs and terminals; TFC part/dwg 181-11-03-00.	V1A, V1B coupling transformer. Fig. 6–25.
T2		Same as T1.	V1B, V4A coupling. Fig. 6–25.
T3		Same as T1.	V4A, V5-V6 coupling. Fig. 6–25.
T4		TRANSFORMER, AF: output transformer type TF4RX12AH per MIL-T-27A; 150 to 10,000 cps frequency response; 5000 ohm, 0.010 amps dc primary; 3.2 ohm secondary; 4 Lundey Associates type 199TH terminals; two 6-32 mtg studs, 3/8 in. lg on 1 1/4 in. square mtg centers; 1 5/16 in. square, 1 3/4 in. high overall excl mtg studs and terminals; TFC part/dwg 181-11-00-00.	Speaker output transformer. Fig. 6–25.
T5		TRANSFORMER, AF: output transformer type TF4RX12EA per MIL-T-27A; 200 to 5000 cps ±2 db frequency response; 10,000 ohms, 50 ma primary with center tap; 14,000 ohm secondary; electrostatic shield between primary and secondary; 6 Lundey Associates type 399TH terminals; four 6-32 mtg studs, 3/8 in. lg, on 1 1/4 x 1 3/8 in. mtg centers; 1 15/16 in. lg, 1 13/16 in. wide, 2 3/4 in. high overall excl mtg studs and terminals; TFC part 181-11-02-00.	Stylus output transformer. Fig. 6–25.
T101		Same as T1.	Test signal transformer. Fig. 6–26.
T201		Same as T1.	V205B, V206-V207 coupling. Fig. 6–28.
T301		TRANSFORMER, AF: line type; type TF4RH11AH per MIL-T-27A; 200 to 5000 cps ±2 db frequency response; 500 ohms primary, center tapped; 50,000 ohms 6 dbm secondary, electrostatic shield between primary and secondary; 6 Lundey Associates type 199TH terminals; two 6-32 mtg studs, 3/8 in. lg, on 1 1/4 in. mtg centers; 1 5/16 in. square, 1 3/4 in. high overall excl terminals & mtg studs; TFC part/dwg 181-11-01-00.	Signal input transformer. Fig. 6–27.
T401		TRANSFORMER, POWER, STEP DOWN AND STEP UP: power transformer type TF4RX03YY per MIL-T-27A; 1 primary with taps @ 105 vac, 120 vac, 210 vac and 240 vac; 3 secondaries — one secondary 6.3 vac 2 amps, second secondary 6.3 vac 8 amps, third secondary 330 vac 0.2 adc center tapped and tapped @ 130 vac 0.025 adc; 45 to 65 cps operating frequency range; electrostatic shield between primary and secondaries; 13 Lundey Associates type 399TH terminals; four 1/4-20 mtg studs on 3 x 3 1/4 in. mtg centers; mtg studs 7/16 in. lg; 4 3/8 in. lg, 4 1/4 in. wide, 5 3/8 in. high overall excl mtg studs and terminals; TFC part/dwg 184-11-01-00.	Power transformer. Fig. 5–9.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
TB1 thru TB202		Ref. Desig. Cancelled.	
TB401	(2)	TERMINAL BOARD: c/o plastic board w/24 solder lug terminals; board marked CR401 thru CR407, R401 thru R405; 4⅛ in. lg, 2½ in. wide, 7/16 in. high overall; TFC part/dwg 184-15-02-01. For Reference Only.	Power supply board.
TB601	(2)	TERMINAL BOARD: barrier type; type 8TB10 per MIL-STD-242A; terminal board conforms to MIL-T-16784; 10 terminals (double row); 4⅝ in. lg; TFC part/dwg 180-00-00-11. For Reference Only.	Power input barrier strip on bottom of cabinet. Fig. 2–3.
TB602		Same as TB601.	Power supply barrier strip on bottom of cabinet. Fig. 2–3.
TB603		Same as TB601.	Mech unit barrier strip on bottom of cabinet. Fig. 2–3.
TB604		Same as TB601.	Mech unit barrier strip on bottom of cabinet. Fig. 2–3.
TB605, TB606		Ref. Desig. Cancelled.	
V1		ELECTRON TUBE: type 6386; TFC part 005/V000202.	ALC amplifier. Fig. 3–8.
V2		ELECTRON TUBE: type 12AT7WA; TFC part 005/V000205.	ALC amplifier. Fig. 3–8.
V3		ELECTRON TUBE: type 5670; TFC part 005/V000204.	Speaker amplifier. Fig. 3–8.
V4		Same as V2.	Signal amplifier and print driver. Fig. 3–8.
V5		ELECTRON TUBE: type 6L6WGB; TFC part 005/V000203.	Print amplifier. Fig. 3–8.
V6		Same as V5.	Print amplifier. Fig. 3–8.
V101		Same as V3.	Control signal amplifier. Fig. 3–8.
V102		ELECTRON TUBE: type 6829; TFC part 005/V000208.	A-Operate relay. B-start/stop relay. Fig. 3–8.
V103		Same as V2.	Test signal oscillator. Fig. 3–8.
V104		Same as V3.	Voltage regulator. Fig. 3–8.
V105		ELECTRON TUBE: type 5687WA; TFC part 005/V000210.	Voltage regulator. Fig. 3–8.
V106		Same as V105.	Voltage regulator. Fig. 3–8.
V107	(1)	ELECTRON TUBE: type 6627/0B2WA; TFC part 005/V000209.	Voltage rectifier. Fig. 3–8.
V201	(1)	ELECTRON TUBE: type 5654; TFC part 005/V000206.	Fork amplifier. Fig. 3–8.
V202		Same as V3.	Fork driver and amplifier. Fig. 3–8.
V203		Same as V3.	Frequency divider. Fig. 3–8.
V204		ELECTRON TUBE: type 5727/2D21W; TFC part 005/V000207.	Phasing thyratron. Fig. 3–8.
V205		Same as V3.	Phasing signal amplifier and motor amplifier driver. Fig. 3–8.
V206		Same as V5.	Sync motor drive amplifier. Fig. 3–8.
V207		Same as V5.	Sync motor drive amplifier. Fig. 3–8.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
W1		CABLE ASSEMBLY, POWER, ELECTRICAL: c/o 3 stranded type COS 18 AWG conductors, 1 ea white, black & red; black Buna-S jacket; .28 to .30 cable dia; one end terminated in 3 spade lugs Patton-McGuyer Co. cat. No. RM106A; other end terminated in plug connector type UP121M per MIL-C-3767 (P1) and one spade lug as above; cable conforms to MIL-C-3884; approx 10½ ft. lg; TFC part/dwg 180-00-10-00. For Reference Only.	Power cord.
W201, W601		Ref. Desig. Cancelled.	
XC219	(1)	SOCKET, ELECTRON TUBE: octal; type TS101P02 per JAN-S-28A; TFC part/dwg 41D-20-03-02.	Sockets for C219 and C404.
XDS1 thru XDS4		LAMPHOLDER: accomodates one miniature bayonet base lamp (NE51); crystal stovepipe shaped jewel, ½ in. dia; type LH64PC5 per MIL-STD-242A and MIL-L-3661; 2$\frac{7}{32}$ in. max lg overall; TFC part/dwg 181-00-02-02.	Holders for DS1 thru DS4.
XDS201		LAMPHOLDER: accomodates 1 T-3¼ bulb (GE #47); green jewel, $\frac{5}{8}$ in. dia; type LH62PG2 per MIL-STD-242A and MIL-L-3661; 2$\frac{7}{32}$ in. max lg overall; TFC part/dwg 181-00-01-05.	Holder for pilot light DS201.
XDS202		LAMPHOLDER: accomodates 1 miniature bayonet base lamp (NE51); white jewel, $\frac{5}{8}$ in. dia; type LHPW2 per MIL-STD-242A and MIL-L-3661; 2$\frac{7}{32}$ in. lg max overall; TFC part/dwg 181-00-00-11.	Holder for phasing neon DS-202.
XE1 thru XE4		Ref. Desig. Cancelled.	
XF201, XF202		FUSEHOLDER: indicating type; for two cartridge type fuses; w/integral indicators; BuShips plan No. 9000-S6202-F-74228 rev. B; FIC type 10FH2; TFC part/dwg 181-00-01-04.	Holder for line fuses F201 and F202.
XF203		FUSEHOLDER: indicating type; for one cartridge type fuse; w/integral indicator; BuShips plan No. 9000-S6202-F-74230 rev. B; FIC type 12FH1; TFC part/dwg 181-00-01-03.	Holder for B+ fuse F203.
XF204		FUSEHOLDER: indicating type; for one cartridge type fuse; w/integral indicator; BuShips plan No. 9000-S-6202-F-7429; FIC type 10FH1; TFC part/dwg 181-00-01-02.	For F204.
XF601		FUSEHOLDER: extractor post type; for one cartridge type 1¼x1¼ in. fuse; type FHN20G per MIL-F-19207; TFC part/dwg 181-00-03-01.	For F601.
XK101, XK102		SOCKET, RELAY: 14 pins; conforms to all applicable sections of JAN-S-28A; one-piece saddle mtg; two ⅛ in. dia mtg holes on 1⅛ in. centers; 1⅜ in. dia by $\frac{11}{16}$ in. thick overall; HHE part No. 9759-8; TFC part/dwg 181-00-00-19.	Sockets for K101 and K102.
XV1 thru XV4	(1)	SOCKET, ELECTRON TUBE: 9 pin miniature; type TS103P03, MS91515-2 per JAN-S-28A; TFC part/dwg 181-00-00-17.	For V1 thru V4.
XV5, XV6		Same as XC219.	For V5, V6.
XV101 thru XV106		Same as XV1.	For V101 thru V106.
XV107, XV201	(1)	SOCKET, ELECTRON TUBE: 7 pin miniature; type TS102P03, MS91514-2 per JAN-S-28A; TFC part/dwg 181-00-00-18.	For V107, V201.
XV202, XV203		Same as XV1.	For V202, V203.
XV204		Same as XV107.	For V204.
XV205		Same as XV1.	For V205.
XV206, XV207		Same as XC219.	For V206, V207.

TABLE 7–1. RECORDER SET, FACSIMILE AN/UXH-2, MAINTENANCE PARTS LIST (Cont)

REF. DESIG.	NOTES	NAME AND DESCRIPTION	LOCATING FUNCTION
Y201		FORK, TUNING: fixed frequency, 3600 cps; hermetically sealed metal case; 5 solder lug terminals; high stability of frequency; pressure and temperature compensated; fork sealed in vacuum; approximately 5 in. lg, 3 in. wide, 1 1/16 in. high overall; TFC part/dwg 100B-3600-00.	Generates and maintains stable 3600 cps frequency. Fig. 5–16.
Z100		AMPLIFIER, ELECTRICAL CONTROL AM-1845/UXH-2: c/o amplifier, automatic control, phase, fork and sync motor circuitry; 29 5/8 in. lg, 9 9/32 in. wide, 7 in. deep overall; TFC part/dwg 181-00-00-00.	Amplifies input signal and applies it to recorder (Z500); also generates stable synchronous frequency. Fig. 1–2.
Z400		POWER SUPPLY PP-1901/UXH-2: c/o power transformer and associated circuitry, blower assembly and line voltage switch; 21 in. lg, 8 7/8 in. high, 6 1/16 in. deep overall; TFC part/dwg 184-15-00-00.	Supplies power for amplifier (Z100) and recorder (Z500). Fig. 1–2.
Z500		RECORDER, FACSIMILE RO-76/UXH-2: c/o sync, run, paper feed, and print mechanisms; 27 3/4 in. lg, 10 1/8 in. wide, 14 3/4 in. high overall; TFC part/dwg 182-00-00-00.	Provides synchronized and phased movement of stylus needles and paper feed; "mech unit". Fig. 1–2.
		PAPER, RECORDING: electrosensitive, dry; 19 1/8 in. wide, 450 ft. lg roll; "Time-fax NDA"; TFC part No. 220-306-045.	Recording paper roll.

TABLE 7–2. RECORDER SET, FACSIMILE AN/UXH-2, STOCK NUMBER IDENTIFICATION

REF. DESIG.	STOCK NUMBERS			
	FEDERAL	STANDARD NAVY	SIGNAL CORPS	USAF
A601				
B401	N4140-630-0361			
B501	N6105-630-0378			
B502	N6105-630-0368			
C1	N5910-666-8810			
C2	N5910-666-8835			
C3	N5910-644-6238			
C4	N5910-666-8806			
C7	N5910-112-7408			
C9	N5910-553-7144			
C105	N5910-668-7563			
C107	*N5910-557-6129			
C108	N5910-164-7447			
C110	N5910-161-0207			
C112	N5910-284-4050			
C204	N5910-644-5821			
C206	N5910-642-6267			
C209	N5910-101-4775			
C213	N5910-644-6162			
C215	N5910-101-5783			
C216	N5910-636-2134			
C218	N5910-543-0845			
C219	N5910-227-0744			
C401	N5910-120-1660			
C403	N5910-120-1687			
C404	N5910-270-8975			
C501	N5910-101-4724			
C502	N5910-101-4530			3330-37619-000
C505	N5910-577-3222			
C601	N5910-617-5258			
CR1	N5960-636-0147			
CR201	N5960-624-1245			
CR401	N5960-624-1247			
DS1	G6240-223-9100			
DS201	G6240-155-8706			

TABLE 7–2. RECORDER SET, FACSIMILE AN/UXH-2, STOCK NUMBER IDENTIFICATION (Cont)

REF. DESIG.	STOCK NUMBERS			
	FEDERAL	STANDARD NAVY	SIGNAL CORPS	USAF
E1	5935-			
E501	5950-			
E502	5950-			
E504				
F201	N5920-518-1789			
alt.				
F201	N5920-518-1793			
F203	N5920-624-1248			
F204	N5920-296-1224			
F601	N5920-243-3787			
FL101	N5915-630-0369			
FL102	N5835-612-1592			
FL103	N5915-630-0370			
FL201	N5915-630-0371			
FL501	N4130-624-1253			
FL601	N5915-630-0372			
FL605	N6810-630-0355			
FL606				
H1	5935-			
H2	5905-			
H3	N5960-248-1925			
H4	N5960-273-2451			
H5	5307-			
H6	5307-			
H101	N5960-092-1066			
H102				
H201	N5960-273-2456			3370-839000-3816
H301	N5355-553-4847			
H302	N5355-538-7474			
H401	N5305-286-1738			
H501	N5340-598-7512			
H502	N5340-205-4724			
H503	N5340-545-4745			
H504	N5340-598-0773			
H505	N5340-545-4740			
H506	N5340-526-1111			
H507	N5340-205-4323			
H508	N5340-598-1413			
H509	N5340-205-4326			
H510	N5340-598-1309			
H511	N5340-597-0489			
H512	N5340-205-6553			
H513	N5340-598-1780			
H514	5310-			
H515	5310-			
H516	5815-			
H517	5305-			
H518	5305-			
H519	5305-			
H520	5310-			
H521	5310-			
H522	5310-			
H523	5310-			
H524	5355-			
H525	5815-			
H526	5310-			
H527	5940-			
H528	5940-			
H529	5310-			
H530	5310-			
H531	5310-			
H532	5310-			
H533	5305-			
H534	5305-			
H536	5815-			
H537	5305-			
H538	5310-			

TABLE 7–2. RECORDER SET, FACSIMILE AN/UXH-2, STOCK NUMBER IDENTIFICATION (Cont)

REF. DESIG.	STOCK NUMBERS			
	FEDERAL	STANDARD NAVY	SIGNAL CORPS	USAF
H539	5815-			
H540				
H541	N5815-161-9002			
H542	N5305-206-2272			
H543				
H601	N5120-293-0018			
H602	N5120-288-9717			
H603	N5120-293-0048			
H604	N5120-198-5401			
H605	N5120-242-7410			
H606	N5120-224-2504			
H607	N5120-240-5292			
H608	N5120-198-5392			
H609				
H611				
H612				
H613				
H614				
H615	N5310-637-4754			
H616				
H617	N5340-200-5233			
H618	N5325-298-7009			
H619				
J1	N5935-553-2899			
J2	N5935-542-9821			
J5	N5935-539-2178			
J6	N5935-552-6842			
J7	N5935-553-2898			
J101	N5935-666-3003			
J102	N5935-552-7613			
J202	N5935-542-9823			
J601	N5935-312-7985			
K1	N5815-612-1598			
K101	N5945-617-7966			
L401	N5950-615-5670			
LS601	5965-			
M301	N6625-631-7260			
M601				
M602				
MP1	N5845-588-8742			
MP2	N5835-612-1601			
MP3	N5835-589-6301			
MP9	N5835-589-6299			
MP10	5815-			
MP11	N3110-155-8448			
MP12	5815-			
MP14	5815-			
MP15	N5340-260-3403			
MP16	N5815-624-1250			
MP17	5815-			
MP18	N3110-155-9628			
MP19	N3110-155-8416			
MP20	5815-			
MP21	5815-			
MP22	5815-			
MP25	N5815-624-1255			
MP28	5815-			
MP29	N3120-630-0375			
MP30	~~3110~~ 5815-670-2802			
MP31	5815-			
MP32	5815-			
MP33	5815-			
MP34	5815-			
MP35	5815-			
MP36	5815-			
MP36.1	5815-			
MP37	5815-			

TABLE 7–2. RECORDER SET, FACSIMILE AN/UXH-2, STOCK NUMBER IDENTIFICATION (Cont)

REF. DESIG.	STOCK NUMBERS			
	FEDERAL	STANDARD NAVY	SIGNAL CORPS	USAF
MP38	5815-			
MP39	5815-			
MP40	N3110-144-8858			
MP41	5815-			
MP42	5815-			
MP43	5815-			
MP44	N3110-100-6211			
MP45	5815-			
MP46	5815-			
MP47	5815-			
MP48	5815-			
MP49	5815-			
MP54	5815-			
MP55	5815-			
MP56	5815-			
MP57	5815-			
MP58	N5815-624-1256			
MP59				
MP60	5815-			
MP62	N3110-516-5542			
MP63	5815-			
MP64	5815-			
MP65	5815-			
MP66	5815-			
MP67	5815-			
MP68	5815-			
MP69	5815-			
MP74	5815-			
MP75	5815-			
MP77	5815-			
MP78	5815-			
MP79	5815-			
MP80	5815-			
MP81	5315-			
MP82	5815-			
MP86	5815-			
MP88	5815-			
MP90	5815-			
MP92	5815-			
MP93	5815-			
MP95	5815-			
MP96	5815-			
MP97	5815-			
MP98	5815-			
MP99	N5845-627-3901			
MP100	5815-			
MP101	5815-			
MP103	N5835-612-1621			
MP104	5990-			
MP105	N3110-155-8416			
MP107	5340-			
MP108	N4730-277-7137			
MP109				
MP110				
MP112				
MP113				
MP114				
MP115				
MP116				
MP117				
MP118				
MP119				
MP120				
MP121				
MP122				
MP123				
MP124				

TABLE 7–2. RECORDER SET, FACSIMILE AN/UXH-2, STOCK NUMBER IDENTIFICATION (Cont)

REF. DESIG.	STOCK NUMBERS			
	FEDERAL	STANDARD NAVY	SIGNAL CORPS	USAF
MP125				
MP126				
MP127				
MP128				
MP129				
MP130				
MP131				
MP132				
MP133				
MP134				
MP135				
MP136				
MP137				
MP138				
MP139				
P1	N5935-636-7145			
P101	N5935-503-6596			
R1	N5905-190-8889			
R2	N5905-279-3495			
R3	*N5905-190-8883			
R4	*N5905-279-3503			
R5	*N5905-195-6761			
R6	*N5905-254-9201			
R7	*N5905-279-1754			
R8	*N5905-171-2000			
R11	*N5905-171-1976			
R12	*N5905-256-3361			
R13	*N5905-279-3506			
R14	*N5905-279-2515			
R15	*N5905-171-1998			
R16	*N5905-279-1873			
R17	*N5905-171-2004			
R18	*N5905-279-1757			
R19	*N5905-192-3981			
R21	*N5905-279-2522			
R27	N5905-577-6705			
R28	*N5905-252-4018			
R30	N5905-502-3077			
R101	*N5905-299-2013			
R103	*N5905-192-0390			
R107	N5905-279-1875			
R111	*N5905-279-1880			
R115	*N5905-279-3497			
R116	*N5905-171-1986			
R122	*N5905-195-6806			
R126	N5905-642-3576			
R130	N5905-174-2341			3350-890500-2771
R201	*N5905-279-1876			
R203	*N5905-185-8510			
R211	*N5905-249-3661			
R213	*N5905-279-3502			
R214	*N5905-192-0667			
R219	*N5905-192-0450			
R221	*N5905-539-4900			
R223	*N5905-279-1933			
R227	*N5905-279-1719			
R231	*N5905-279-1954			
R301	N5905-617-7758			
R401	N5905-644-9432			
R402	N5905-258-7358			
R404	N5905-504-4263			
R501	N5905-636-7787			
S101	N5930-617-7665			
S301	N5930-630-0376			
S302	N5930-615-5839			
S303	N5930-050-2709			
S304	N5930-259-9405			

TABLE 7–2. RECORDER SET, FACSIMILE AN/UXH-2, STOCK NUMBER IDENTIFICATION (Cont)

REF. DESIG.	STOCK NUMBERS			
	FEDERAL	STANDARD NAVY	SIGNAL CORPS	USAF
S305	N5930-050-2707			
S501	N5930-253-8796			
T1	N5950-630-0377			
T4	N5950-630-0364			
T5	N5950-630-0366			
T301	N5950-~~581-8690~~ 630-0367			
T401	~~N5950-581-8690~~	N5950-519-1947		
V1	N5960-636-2244			
V2	N5960-262-0167			
V3	N5960-188-6584			
V5	N5960-262-0161			
V102	N5960-646-4756			
V105	N5960-262-0173			
V107				
V201				
V204	N5960-248-3060			
XC219	*N5935-331-3141			
XDS1	N6210-539-9889			
XDS201				
XDS202	N6210-669-6578			
XF201	N5920-296-5869			
XF203	N5920-636-0177			
XF204	N5920-			8870-552750-275
XF601	N5920-556-0144			
XK101	5935-			
XV1	*N5935-644-5377			
XV107	*N5935-222-9744			
Y201	N7720-630-0379			
Z100	5815-			
Z400	5815-			
Z500	5815-			
Recording Paper	N7530-624-1254			

*For Replacement Use.

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TABLE 7–3. RECORDER SET, FACSIMILE AN/UXH-2, STOCK NUMBER CROSS REFERENCE

FEDERAL	REF. DESIG.	FEDERAL	REF. DESIG.	FEDERAL	REF. DESIG.
3110-100-6211	MP44	5905-252-4018	R28	5920-556-0144	XF601
3110-144-8858	MP40	5905-254-9201*	R6	5920-624-1248	F203
3110-155-8416	MP19	5905-256-3361*	R12	5920-636-0177	XF203
3110-155-8448	MP11	5905-258-7358	R402	5930-050-2707	S305
3110-516-5542	MP62	5905-279-1719*	R227	5930-050-2709	S303
3120-630-0375	MP29	5905-279-1754*	R7	5930-253-8796	S501
4130-624-1253	FL501	5905-279-1757*	R18	5930-259-9405	S304
4140-630-0361	B401	5905-279-1873*	R16	5930-615-5839	S302
4730-277-7137	MP108	5905-279-1875	R107	5930-617-7665	S101
5120-198-5392	H608	5905-279-1876*	R201	5930-630-0376	S301
5120-198-5401	H604	5905-279-1880*	R111	5935-222-9744	XV107
5120-224-2504	H606	5905-279-1933*	R223	5935-312-7985	J601
5120-240-5292	H607	5905-279-1954*	R279	5935-331-3141	XC219
5120-242-7410	H605	5905-279-2515*	R14	5935-503-6596	P101
5120-288-9717	H602	5905-279-2522*	R21	5935-539-2178	J5
5120-293-0018	H601	5905-279-3495	R2	5935-542-9821	J2
5120-293-0048	H603	5905-279-3497*	R115	5935-542-9823	J202
5305-206-2272	H542	5905-279-3502*	R213	5935-552-6842	J6
5305-286-1738	H401	5905-279-3503*	R4	5935-552-7613	J102
5310-637-4754	H615	5905-279-3506*	R13	5935-553-2898	J7
5325-298-7009	H618	5905-299-2013*	R101	5935-553-2899	J1
5340-200-5233	H617	5905-502-3077	R30	5935-636-7145	P1
5340-205-4323	H507	5905-504-4263	R404	5935-644-5377	XV1
5340-205-4724	H502	5905-539-4900*	R221	5935-666-3003	J101
5340-205-4326	H509	5905-577-6705	R27	5945-617-7966	K101
5340-205-6553	H512	5905-617-7758	R301	5950-581-8690	T401
5340-260-3403	MP15	5905-642-3576	R126	5950-615-5670	L401
5340-526-1111	H506	5905-644-9432	R401	5950-630-0364	T4
5340-545-4740	H505	5910-101-4530	C502	5950-630-0366	T5
5340-545-4745	H503	5910-101-4724	C501	5950-630-0367	T301
5340-597-0489	H511	5910-101-4775	C209	5950-630-0377	T1
5340-598-0773	H504	5910-101-5783	C215	5960-092-1066	H101
5340-598-1309	H510	5910-112-7408	C7	5960-188-6584	V3
5340-598-1413	H508	5910-120-1660	C401	5960-248-1925	H3
5340-598-1780	H513	5910-120-1687	C403	5960-248-3060	V204
5355-538-7474	H302	5910-161-0207	C110	5960-262-0161	V5
5355-553-4847	H301	5910-164-7447	C108	5960-262-0167	V2
5815-161-9002	H541	5910-227-0744	C219	5960-262-0173	V105
5815-612-1598	K1	5910-270-8975	C404	5960-273-2451	H4
5815-624-1250	MP16	5910-284-4050	C112	5960-273-2456	H201
5815-624-1255	MP25	5910-543-0845	C218	5960-624-1245	CR201
5815-624-1256	MP58	5910-553-7144	C9	5960-624-1247	CR401
5835-589-6299	MP9	5910-557-3222	C505	5960-636-0147	CR1
5835-589-6301	MP3	5910-557-6129*	C107	5960-636-2244	V1
5835-612-1592	FL102	5910-617-5258	C601	5960-646-4756	V102
5835-612-1601	MP2	5910-636-2134	C216	6105-630-0368	B502
5845-588-8742	MP1	5910-642-6267	C206	6105-630-0378	B501
5845-627-3901	MP99	5910-644-5821	C204	6210-539-9889	XDS1
5905-171-1976*	R11	5910-644-6162	C213	6210-669-6578	XDS202
5905-171-1986*	R116	5910-644-6238	C3	6240-155-8706	DS201
5905-171-1998*	R15	5910-666-8806	C4	6240-223-9100	DS1
5905-171-2000*	R8	5910-666-8810	C1	6625-631-7260	M301
5905-171-2004*	R17	5910-666-8835	C2	6810-630-0355	FL605
5905-174-2341	R130	5910-668-7563	C105	7530-624-1254	Record-ing Paper
5905-185-8510*	R203	5915-630-0369	FL101		
5905-190-8883*	R3	5915-630-0370	FL103	7720-630-0379	Y201
5905-190-8889	R1	5915-630-0371	FL201		
5905-192-0390*	R103	5915-630-0372	FL601		
5905-192-0450*	R219	5920-243-3787	F601	**USAF**	
5905-192-0667*	R214	5920-296-1224	F204		
5905-192-3981*	R19	5920-296-5869	XF201	3330-37619-000	C502
5905-195-6761*	R5	5920-518-1789	F201	3350-890500-2771	R130
5905-195-6806*	R122		Alt.	3370-839000-3816	H201
5905-249-3661*	R211	5920-518-1793	F201		

*For replacement.

TABLE 7–4. LIST OF MANUFACTURERS

ABBREVIATION	NAME	ADDRESS
ABC	Allen Bradley Co.	136 W. Greenfield Ave., Milwaukee 4, Wisc.
ADC	Acme Danneman Co., Inc.	45 W. 18th St., New York 11, N.Y.
AMP	Amphenol Electronics Corp.	1830 S. 54th Ave., Chicago 50, Ill.
BAR	Barden Corp.	E. Franklin St., Danbury, Conn.
BEC	Bodine Electric Co.	Ohio St. & Oakley Blvd., Chicago 12, Ill.
BGC	Boston Gear Co.	480 Canal St., New York 13, N.Y.
BMC	Bussman Manufacturing Co.	St. Louis 7, Mo.
BRC	Breeze Corp., Inc.	700 Liberty Ave., Union, N.J.
CCC	Carbide & Carbon Chemical Co.	30 E. 42nd St., New York 17, N.Y.
CFC	Camloc Fastener Corp.	22 Spring Valley Rd., Paramus, N.J.
CLA	Clarostat Mfg. Co., Inc.	Dover, N.H.
DMC	Diehl Manufacturing Co.	Sommerville, N.J.
FAR	Farr Co.	51 E. 42nd St., New York 17, N.Y.
FBC	Fuller Brush Co.	3586 Main St., Hartford, Conn.
FIC	Fuse Indicator Corp.	418 Textile Bldg., 99 Chauncey St., Boston 11, Mass.
FIL	Filtron Co., Inc.	131-05 Fowler Ave., Flushing, N.Y.
GE	General Electric Co.	Nela Park, Cleveland 12, Ohio
HET	Hetherington, Inc.	Sharon Hill, Penna.
HHE	Hugh H. Eby, Inc.	4701 Germantown Ave., Phila. 44, Penna.
HPI	High Precision, Inc.	377 Morse St., Hamden, Conn.
HSC	Hoffman Semiconductor Div.	930 Pitner Ave., Evanston, Ill.
KAN	Karl A. Neise	404 Fourth Ave., New York 6, N.Y.
IER	International Electronic Research Corp.	145 W. Magnolia Blvd., Burbank, Calif.
MRC	Marvin Rockwell Corp.	40 W. 3rd St., New York 2, N.Y.
NDP	New Departure Div., GMC	Bristol, Conn.
OEC	Oxford Electric Corp.	3911 S. Michigan Ave., Chicago 15, Ill.
OMC	Oak Manufacturing Corp.	1260 N. Claybourn Ave., Chicago 10, Ill.
PAC	Paul Abbe Co.	Abbe & Center Aves., Little Falls, N.J.
RAY	Raytheon Mfg. Co.	100 River St., Waltham 54, Mass.
TII	Thomas Industries, Inc.	Manhasset, New York
VPC	Vaco Products Co.	317 E. Ontario St., Chicago 11, Ill.
WKC	Waldes Kohinoor Inc.	47-16 Austel Pl., Long Island City 1, N.Y.
WB	Wallace Barnes Co.	Bristol, Conn.
WRM	Wiremold Co.	Hartford 10, Conn.

TABLE 7–5. NOTES

(1) Stock numbers given in table 7–2 for these components are for replacement use.

(2) Components described as "For Reference Only" are listed only because they are referred to in the text. They are not maintenance parts.

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